CANADIAN ELECTRIC UTILITIES

ANALYSIS OF
GENERATION AND TRENDS
1988

NATIONAL ENERGY BOARD
JULY 1990

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DEFINITIONS* AND ABBREVIATION OF TERMS

Power: Power is the rate of delivery of energy and is measured in watts (W). (Electric energy is measured in watt hours.)

Capacity: In the electric power industry, this word has two meanings:

1. Power, that is, the rate of delivery of energy. For example, a utility might sell 50 megawatts of capacity, i.e. of power.

2. The maximum quantity of power that some piece of equipment is capable of carrying. For example, a generating unit might have a rated capacity of 50 megawatts.

Energy: The capacity of doing work.

Electrical Energy: Energy in the form of electricity, normally expressed in units of watt hours or decimal multiples of watt hours.

Power:	"kW" - kilowatts	=	1 000 W
	"MW" - megawatts	=	1 000 kW
	"GW" - gigawatts	=	1 000 000 kW
	"TW" - terawatts	=	1 000 000 000 kW
Energy:	"kW.h" - kilowatt-hours	=	1 000 W.h
	"MW.h" - megawatt-hours	=	1 000 kW.h
	"GW.h" - gigawatt-hours	=	1 000 000 kW.h
	"TW.h" - terawatt-hours	=	1 000 000 000 kW.h

*Definitions are from "Electric Power: A compendium of terms" - Information Bulletin 8 - May 1985 - National Energy Board.

NOTE ON METRIC CONVERSION

The following table provides some conversion factors and metric equivalents, which are included to assist readers who may wish to convert information into Imperial Units.

Approximate Conversion Factor

S.I. Units		Imperial Units
1 cubic metre (m^3)	=	35.3 cubic feet
1 cubic metre (m^3)	=	6.3 barrels
1 litre (L)	=	0.22 gallon
1 kilogram (kg)	=	2.208 pounds
1 metric tonne	=	1.1023 short tons
1 gigajoule (GJ)	=	0.95 million British thermal units

Metric Equivalents

1 megagram	=	1 metric tonne
1 kilolitre	=	1 cubic metre

Introduction

This report continues a series of reports that have been published by the Board since 1971. Prior to that year, the information had been compiled for internal Board use. The report has been found to be of interest to those concerned with electric power matters in Canada. It is mailed to electric utilities, libraries, universities, agencies and other interested parties in Canada and the United States.

The report uses data submitted by the electric utilities to Statistics Canada. The Board received the final 1988 data from Statistics Canada in February 1990.

The report covers the net generation of electricity by Canadian electric utilities during the calendar year 1988 and gives totals for Canada with the breakdown by province, together with an analysis of fuel consumption, fuel costs and thermal generating plant heat rates. Historical trends for the period 1984 to 1988 inclusive are described.

The analysis presented in Sections 1 to 4 of this report does not include the 38 865 GW.h (7.9 percent of the Canadian total) that were generated in 1988 by approximately 6 113 MW of installed capacity owned by industrial establishments. In Section 5, the industrial generation is shown on net generation and consumption graphs in order to present the complete picture.

Since the report deals with net station output to the electric utility systems, excluding station service, negative generation figures occur occasionally where a plant has used more electricity than it produced.

1. UTILITY GENERATION IN CANADA

The total Canadian utility installed capacity at the end of 1988 was 94 911 MW; the corresponding energy generation was 451 784 GW.h. Table 1.A shows the distribution of the installed capacity and energy production by primary energy source.

TABLE 1.A

CANADIAN UTILITY GENERATION BY PRIMARY ENERGY SOURCE

FUEL TYPE	CAPACITY		ENERGY	
	(%)	(MW)	(%)	(GW.h)
FOSSIL	30.2	28 686.1	21.8	98 452.1
HYDRO	56.5	53 632.0	60.9	275 156.0
URANIUM	13.3	12 563.0	17.3	78 176.0
TOTAL	**100.0**	**94 911.0**	**100.0**	**451 784.1**

The installed capacity in each province at the end of 1988 and the energy generation in each province in 1988 are summarized in Table 1.B below. Detailed information is given in the Appendix. Each province's total net generation includes electric production for use within that province, and may include sales to other provinces and exports to the United States.

TABLE 1.B

INSTALLED CAPACITY AND GENERATION BY PROVINCE AND TERRITORY

PROVINCE/TERRITORY	CAPACITY		ENERGY	
	(%)	(MW)	(%)	(GW.h)
NEWFOUNDLAND*	7.7	7 317.8	9.0	40 735.8
PRINCE EDWARD ISLAND	0.1	122.1	0.0**	85.1
NOVA SCOTIA	2.2	2 103.7	1.9	8 511.7
NEW BRUNSWICK	3.5	3 336.2	3.4	15 192.2
QUÉBEC	26.5	25 172.7	29.3	132 494.9
ONTARIO	33.8	32 064.7	30.8	138 951.2
MANITOBA	4.3	4 082.3	3.5	16 262.2
SASKATCHEWAN	3.0	2 766.4	2.8	12 617.1
ALBERTA	7.4	6 983.6	8.2	36 934.3
BRITISH COLUMBIA	11.2	10 670.7	10.9	49 125.0
YUKON	0.1	122.6	0.1	439.3
NORTHWEST TERRITORIES	0.2	168.3	0.1	435.4
TOTAL	**100.0**	**94 911.1**	**100.0**	**451 784.2**

* Includes Churchill Falls generating station..

** Less than 0.1 percent

Table 1.C shows the distribution of the total Canadian utility fossil-fuel fired generating capacity and the energy production in 1988. Although, on a national basis, coal-fired generating facilities are the most important sources of fossil-fuel generated electricity in Canada, it should be noted that this is not true in all regions. Many communities in isolated regions rely heavily on fuel oil for their electricity supply. Other regions are heavily reliant on non-fossil fuel sources such as nuclear or hydro. Specific details are provided in Tables 1.4 to 1.6 of the Appendix.

Statistics for multi-fuelled plants are not segregated in the appendix. Those plants are classified by the main fuel used for electricity generation.

TABLE 1.C

CANADIAN UTILITY GENERATION BY TYPE OF FOSSIL- FUELLED GENERATION UNITS

UNIT TYPE	CAPACITY		ENERGY	
	(%)	(MW)	(%)	(GW.h)
STEAM: OIL	17.9	5 143.9	9.0	8 892.3
COAL	66.0	18 929.6	87.3	85 944.2
GAS	7.7	2 196.5	2.2	2 139.7
GAS TURBINE*	6.8	1 937.0	0.7	729.0
INTERNAL COMBUSTION*	1.6	479.1	0.8	747.0
TOTAL	**100.0**	**28 686.1**	**100.0**	**98 452.2**

* These unit types may use light fuel oil, diesel fuel or natural gas.

Various types of coal and oil are used for power generation. Table 1.D shows that a significant proportion of the energy generated from coal was produced with imported bituminous coal. Of the total coal used to generate electricity in Canada, Canadian subbituminous coal provided the largest portion of Canadian coal, virtually all of it used in Alberta. However, if imported bituminous coal is included, total bituminous coal provided the largest portion at 46 percent of total coal consumed in Canada. Most of the energy generated from oil was from heavy fuel (residual) oil. Tables 1.7 and 1.8 of the Appendix provide additional information on coal- and oil-fired facilities.

TABLE 1.D

CANADIAN UTILITY GENERATION BY TYPE OF COAL AND OIL

	COAL-FIRED			OIL-FIRED	
TYPE OF COAL	(%)	(GW.h)	TYPE OF OIL	(%)	(GW.h)
BITUMINOUS	17.9	15 328.5	HEAVY	93.6	9 274.9
SUBBITUMINOUS	38.0	32 449.6	LIGHT	1.9	188.8
LIGNITE	15.9	13 607.5	DIESEL	4.5	448.7
CANADIAN COAL SUBTOTAL	**71.8**	**61 385.6**			
IMPORTED BITUMINOUS	28.2	24 076.3			
TOTAL	**100.0**	**85 461.9**	**TOTAL**	**100.0**	**9 912.4**

2. UTILITY GENERATION BY PROVINCE AND TERRITORY

Electrical utility generation by primary energy source for each province and territory is summarized below, in Table 2.A. More detailed 1988 data, including utility-reported fuel costs, are shown in Tables 2.1 to 2.12 of the Appendix.

In the provinces of Québec, Manitoba, and British Columbia, and in the Yukon Territory, hydro generation supplied in excess of 90 percent of electricity requirements. While Newfoundland was statistically also in this category, most of the province's hydro electricity was sold to Québec. Hydro generation also accounted for a significant portion of the energy supply in Ontario and the Northwest Territories. In Ontario approximately one half of the energy generated was produced in nuclear power plants, whereas in New Brunswick approximately 35 percent of its electricity was produced in its nuclear power plant. Most of the balance of the electricity generated in Canada was produced from fossil fuels.

TABLE 2.A

GENERATION BY PRIMARY ENERGY SOURCE
BY PROVINCE AND TERRITORY
PERCENT OF TOTAL
1988

FUEL TYPE	NFLD	PEI	NS	NB	QUE	ONT
COAL - BITUMINOUS	---	---	69.3	11.1	---	22.4
- SUBBITUMINOUS	---	---	---	---	---	---
- LIGNITE	---	---	---	---	---	2.2
OIL - HEAVY	3.4	92.2	17.6	36.8	0.2	0.3
- LIGHT	0.0*	0.2	0.2	0.1	0.0*	0.1
- DIESEL	0.3	7.6	0.3	0.0*	---	0.0*
NATURAL GAS	---	---	---	---	---	0.0*
URANIUM	---	---	---	35.2	4.0	48.6
HYDRO	96.3	---	12.6	16.8	95.8	26.4
TOTAL (%)	100.0	100.0	100.0	100.0	100.0	100.0
TOTAL (GW.h)	40 735.9	85.1	8 511.7	15 192.2	132 491.9	138 951.2

FUEL TYPE	MAN	SASK	ALTA	BC	YUK	NWT
COAL - BITUMINOUS	---	---	1.8	---	---	---
- SUBBITUMINOUS	---	---	87.9	---	---	---
- LIGNITE	5.3	76.8	---	---	---	---
OIL - HEAVY	---	---	---	---	---	3.6
- LIGHT	0.0*	0.1	---	---	---	---
- DIESEL	0.1	0.1	0.0*	0.1	6.9	37.3
NATURAL GAS	---	4.4	6.4	0.3	---	---
URANIUM	---	---	---	---	---	---
HYDRO	94.6	18.6	3.9	99.6	93.1	59.1
TOTAL (%)	100.0	100.0	100.0	100.0	100.0	100.0
TOTAL (GW.h)	16 262.2	12 617.1	36 934.3	49 125.0	439.3	435.4

*Less than 0.1 percent.

3. FUEL CONSUMPTION FOR ELECTRICITY GENERATION BY PROVINCE

Fuels used in 1988 for thermal generation by Canadian electric utilities were coal (bituminous, subbituminous and lignite), oil (light, heavy and diesel), natural gas and uranium. Consumption of these fuels is described in the following sections.

3.1 Coal

3.1.1 Bituminous Coal

Of the total 14.6 million tonnes of bituminous coal (average heat content 27 784 kJ/kg) consumed to generate electricity in Canada in 1988 (Table 3A), 11.0 million tonnes were used in Ontario. Of this, approximately 77 percent was imported from the United States. With the exception of the use of waste metallurgical coal in Alberta, Canadian bituminous coal use was restricted to the provinces of Ontario, Nova Scotia and New Brunswick. The 1988 average cost per tonne of bituminous coal was $61.71 or 22.9 mills ($0.0229) per kilowatt hour. The decrease in the average cost per tonne of bituminous coal in 1988 from 1987 was 11.8 percent, while the corresponding cost per kilowatt hour dropped by 12.3 percent. Details on provincial consumption and cost are provided in Table 3.1 of the Appendix.

TABLE 3.A

BITUMINOUS COAL CONSUMPTION FOR ELECTRICITY GENERATION

PROVINCE	% OF TOTAL	MILLIONS OF TONNES
NOVA SCOTIA	15.5	2.266
NEW BRUNSWICK	4.6	0.678
ONTARIO	75.2	11.006 *
ALBERTA	4.7	0.690
TOTAL	100.0	14.640

* 8.442 MILLION TONNES WERE IMPORTED

3.1.2 Subbituminous Coal

Subbituminous coal (average heat content 18 362 kJ/kg) consumption by electric utilities in 1988 was mainly restricted to Alberta (Table 3.B). Most of Alberta's major generating plants are located close to utility-owned coal mines. As well, the coal is relatively inexpensive to extract. This is why the 1988 average cost of coal to the utilities was only $7.43 per tonne or 4.55 mills per kilowatt hour. The average cost per tonne of subbituminous coal and its cost per kilowatt hour both decreased in 1988 from 1987 by 11.4 percent and 11.3 percent respectively. In 1988, the price of coal was depressed due to a weak export market and low demand for coal. Additional details are provided in Table 3.2 of the Appendix.

TABLE 3.B

SUBBITUMINOUS COAL CONSUMPTION FOR ELECTRICITY GENERATION

PROVINCE	% OF TOTAL	MILLIONS OF TONNES
ALBERTA	100.0	19.86
TOTAL	100.0	19.86

3.1.3 Lignite

In 1988, 75 percent of the lignite coal (average heat content 14 869 kJ/kg) used for generation in Canada was consumed in Saskatchewan (Table 3.C). Ontario and Manitoba used a relatively small amount. The 1988 average cost per tonne was $15.54 or 13.11 mills per kilowatt hour. The decrease in 1988 from 1987 in the average cost per tonne of lignite and cost per kilowatt hour was 2.5 percent and 1.7 percent respectively. Additional details are provided in Table 3.3 of the Appendix.

TABLE 3.C

LIGNITE COAL CONSUMPTION FOR ELECTRICITY GENERATION

PROVINCE	% OF TOTAL	MILLIONS OF TONNES
ONTARIO	18.0	2.07
MANITOBA	6.7	0.77
SASKATCHEWAN	75.3	8.64
TOTAL	100.0	11.48

3.2 Oil

3.2.1 Light Oil

The consumption of light oil (average heat content 38 167 kJ/L) by Canadian utilities, by province, is shown in Table 3.D. Light oil is primarily used in combustion turbines and as a secondary fuel in coal and heavy fuel oil fired plants. The average cost of light oil in 1988 was $199.73 per kilolitre or 66.68 mills per kilowatt hour. The high mill rate cost reflects the use of light oil in ignition, warm-up and short duty applications. The decrease in 1988 from 1987 in the average cost per kilolitre of light oil and the cost per kilowatt hour was 4.0 percent and 6.1 percent respectively, reflecting a general decrease in the world price for oil. Table 3.4 of the Appendix provides additional information on provincial consumption and cost.

TABLE 3.D

LIGHT OIL CONSUMPTION FOR ELECTRICITY GENERATION

PROVINCE	% OF TOTAL	THOUSANDS OF KILOLITRES
NEWFOUNDLAND	2.9	1.8
NOVA SCOTIA	6.0	3.8
NEW BRUNSWICK	5.6	3.5
QUÉBEC	6.5	4.1
ONTARIO	74.4	46.8
MANITOBA	0.8	0.5
SASKATCHEWAN	3.8	2.4
TOTAL	100.0	62.9

3.2.2 Heavy Oil

The provincial consumption of heavy fuel oil (average heat content 41 864 kJ/L) by electric utilities in 1988 is shown in Table 3.E. New Brunswick continues to be the largest user of heavy fuel oil for electricity generation, consuming approximately half the total. In 1988, the average cost of heavy fuel oil to utilities was $96.52 per kilolitre or 24.9 mills per kilowatt hour. The decrease in 1988 from 1987 in the average cost per kilolitre of heavy fuel and the cost per kilowatt hour was 25.8 percent and 26.1 percent respectively. This decrease was again mainly due to the decrease in the world oil price. More detailed heavy oil consumption data are also presented in Table 3.5 of the Appendix.

TABLE 3.E

HEAVY OIL CONSUMPTION FOR ELECTRICITY GENERATION

PROVINCE	% OF TOTAL	THOUSANDS OF KILOLITRES
NEWFOUNDLAND	15.3	366.1
PRINCE EDWARD ISLAND	1.5	35.4
NOVA SCOTIA	16.1	384.8
NEW BRUNSWICK	57.3	1 368.6
QUÉBEC	5.0	119.4
ONTARIO	4.6	111.0
NORTHWEST TERRITORIES	0.2	5.6
TOTAL	**100.0**	**2 390.9**

3.2.3 Diesel Oil

All the provinces and territories, except Québec reported consumption of diesel oil (average heat content 37 880 kJ/L) in 1988 (Table 3.F). Diesel is mainly used to fuel internal combustion generating plants in isolated regions. The largest consumers were therefore provinces with a substantial number of isolated communities: Newfoundland, British Columbia, Yukon and the Northwest Territories. These accounted for approximately 82 percent of the total consumption. The average cost to utilities for diesel fuel in 1988 was $306.92 per kilolitre or 110.19 mills per kilowatt hour. The decrease in 1988 from 1987 in the average cost per kilolitre of diesel oil was 5.6 percent. The cost per kilowatt hour increased slightly in 1988 from 1987 by 1.3 percent. The decrease in the price of oil was due to the fall in the world oil price. Additional details are presented in Table 3.6 in the Appendix.

TABLE 3.F

DIESEL OIL CONSUMPTION FOR ELECTRICITY GENERATION

PROVINCE	% OF TOTAL	THOUSANDS OF KILOLITRES
NEWFOUNDLAND	20.4	32.9
PRINCE EDWARD ISLAND	2.0	3.2
NOVA SCOTIA	6.1	9.8
NEW BRUNSWICK	1.6	2.6
QUÉBEC	0.0	0.0
ONTARIO	0.1	0.2
MAN'TOBA	4.2	6.8
SASKATCHEWAN	1.5	2.5
ALBERTA	2.7	4.4
BRITISH COLUMBIA	16.0	25.8
YUKON	5.2	8.4
NORTHWEST TERRITORIES	40.2	64.8
TOTAL	100.0	161.4

3.3 Natural Gas

Table 3.G below shows the percentage distribution of natural gas (average heat content 38 384 kJ/m^3) consumption by province. In 1988 Alberta accounted for approximately 76 percent of the total, and Saskatchewan 20 percent of the total. The 1988 average cost of natural gas to utilities was $77.86 per thousand cubic metres, or 26.6 mills per kilowatt hour. The increase in 1988 from 1987 in the average cost of natural gas and the cost per kilowatt hour was 20.0 percent and 12.7 percent respectively. This increase in cost is attributable to depressed prices in the previous year. Details are provided in Table 3.7 of the Appendix.

TABLE 3.G

NATURAL GAS CONSUMPTION FOR ELECTRICITY GENERATION

PROVINCE	% OF TOTAL	MILLIONS OF CUBIC METRES
ONTARIO	0.0 *	0.9
MANITOBA	0.0 *	0.5
SASKATCHEWAN	20.1	212.0
ALBERTA	75.8	798.0
BRITISH COLUMBIA	3.9	41.6
TOTAL	100.0	1053.0

3.4 Uranium

Table 3.H summarizes the use, by province, of uranium (average heat content 692 423 kJ/g) for the generation of electricity in 1988. In Canada, only three provinces, Ontario, New Brunswick and Québec have nuclear power reactors for generating electricity. The average cost of uranium fuel in Canada was $279.17 per kilogram of uranium, or 4.85 mills per kilowatt hour. The average cost of uranium increased slightly in 1988 from 1987 by 0.2 percent. However, the cost per kilowatt hour decreased 2.4 percent in 1988 from 1987. Additional details are provided in Table 3.8 of the Appendix.

TABLE 3.H

URANIUM CONSUMPTION FOR ELECTRICITY GENERATION

PROVINCE	% OF TOTAL	THOUSANDS OF KILOGRAMS
NEW BRUNSWICK	7.5	101.9
QUÉBEC	7.0	95.2
ONTARIO	85.5	1 160.5
TOTAL	**100.0**	**1 357.6**

3.5 Comparative Fuel Cost of Electricity Generation

Table 3.I summarizes the fuel costs of electricity generation by types of fuel used to generate electricity in Canada in mills/kW.h with the primary users of those fuels. Although subbituminous coal had the lowest cost advantage in Canada in 1988, this is primarily due to the inexpensive extraction of this resource and the vertical integration of coal mining and power industries in Alberta. The Northwest Territories had the highest generation cost due to the use of oil-fired internal combustion units in mainly isolated communities. More details are provided in Tables 3.1 to 3.8 in the Appendix.

TABLE 3.I

COMPARATIVE FUEL COST OF ELECTRICITY GENERATION

TYPE OF FUEL	Mills/kW.h*	PRIMARY USERS IN CANADA
BITUMINOUS COAL	22.9	ONTARIO, NOVA SCOTIA
SUBBITIMINOUS COAL	4.6	ALBERTA
LIGNITE	13.1	SASKATCHEWAN
LIGHT OIL	66.7	ONTARIO
HEAVY OIL	33.7	NEW BRUNSWICK
DIESEL	110.2	NORTHWEST TERRITORIES
NATURAL GAS	26.6	ALBERTA
URANIUM	4.9	ONTARIO

* Average total cost in Canada.

4. ACTUAL NET STATION HEAT RATES

The efficiency of thermal generating stations can be expressed in terms of their respective heat rates in kJ/kW.h. In this report, net station heat rates are obtained by dividing the gross kilojoule energy input to a station by its net electrical energy generation (net station generation is equal to the gross station generation less the station service load). For presentation purposes, the actual net station heat rates are plotted against unit size based on the nameplate rating of the largest unit in the respective plant. These unit size heat rates are represented by the curves presented in Figure 4.1, 4.2, and 4.3 for the various types of generating stations. The data used reflect actual net station heat rates obtained under actual operating conditions and are not to be confused with design heat rate curves for various types and sizes of thermal units. Because of insufficient data, no curves are shown for nuclear- or gas-fired generating stations.

4.1 Steam Electric Plants

Figure 4.1 shows the 1988 net station heat rates associated with coal- and oil-fired steam electric generating stations in Canada. Coal-fired units ranged in size between 15 and 500 MW; oil-fired units ranged between 20 and 573 MW.

4.2 Gas Turbines

Net heat rates for gas turbines versus unit size are illustrated in Figure 4.2. Because gas turbines of similar sizes may have widely varying heat rates depending on the mode of operation of the units and the ambient air temperature, a single-valued function is not appropriate. Therefore, a range is shown for each unit size. The majority of data points fell between or on the upper and lower curves. As Figure 4.2 shows, the variation in unit size is from 7 to 68 MW. Gas turbines ranged in size between 2.5 and 68 MW.

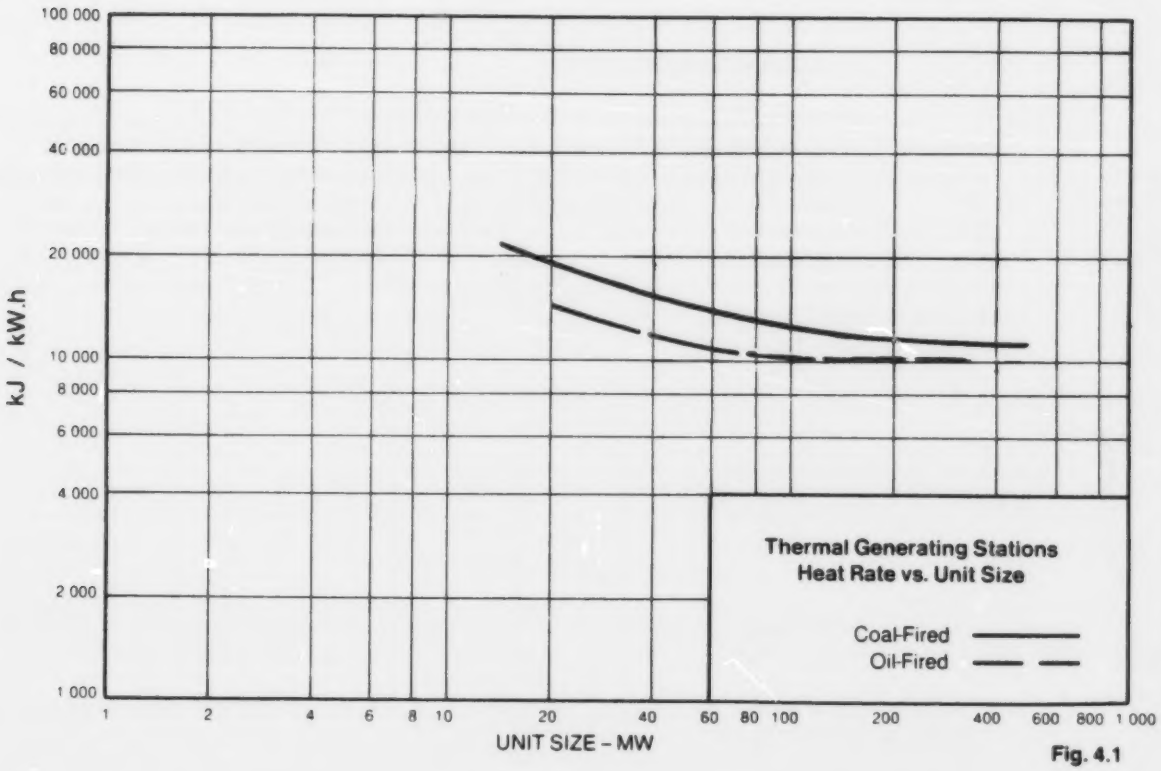
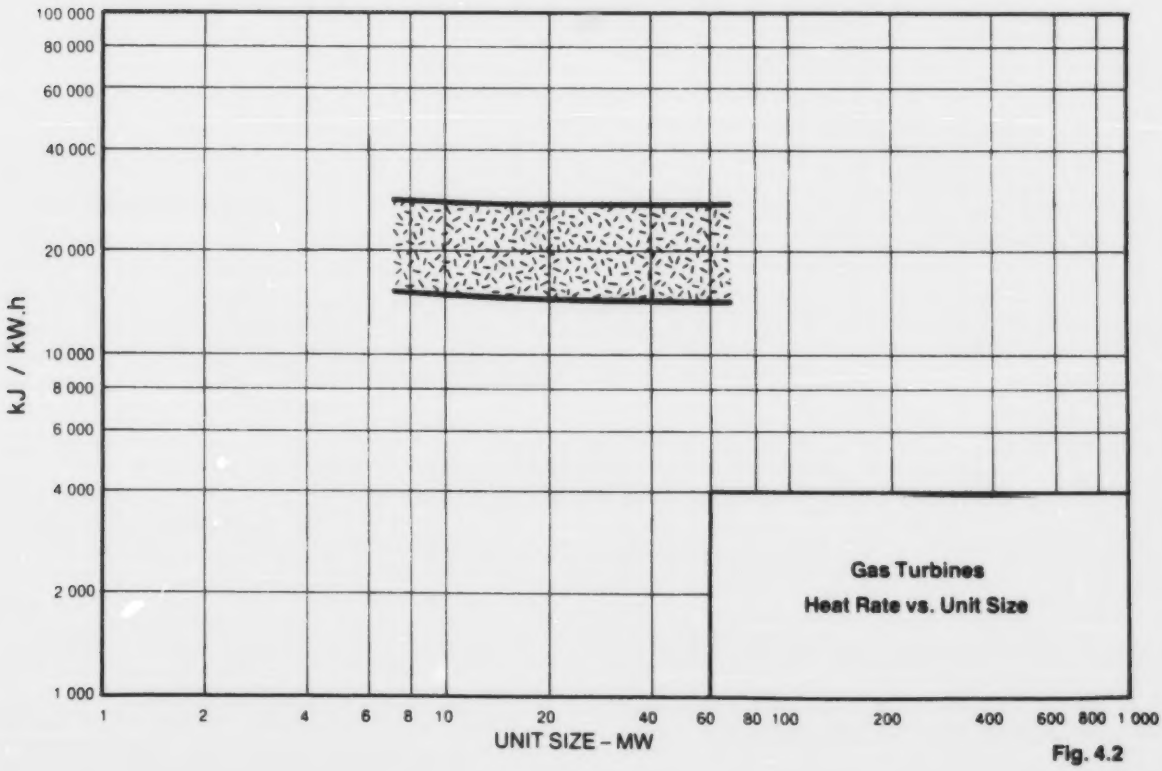

100 000
80 000
60 000
40 000
20 000
10 000
8 000
6 000
4 000
2 000
1 000
kJ / kW.h
1
2
4
6
8
10
20
40
60
80
100
200
400
600
800
1 000
UNIT SIZE – MW
Thermal Generating Stations
Heat Rate vs. Unit Size
Coal-Fired
Oil-Fired

Fig. 4.1


100 000
80 000
60 000
40 000
20 000
10 000
8 000
6 000
4 000
2 000
1 000
kJ / kW.h
1
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6
8
10
20
40
60
80
100
200
400
600
800
1 000
UNIT SIZE – MW
Gas Turbines
Heat Rate vs. Unit Size

Fig. 4.2

4.3 Internal Combustion Units

Analysis of data for internal combustion units of similar sizes shows a variation of heat rates. The lower heat rates reflect units used more or less continuously while the higher values are representative of units used principally for standby operation. Internal combustion unit size versus heat rate relationships can be more appropriately expressed by a curve having an upper and lower bound rather than by a single line. The curve is displayed in Figure 4.3 where most of the data points fell between or on the upper and lower curves. The figure is based on unit sizes ranging from 10 to 6 800 kW. For units larger than 2 000 kW, heat rates range from 10 000 kJ/kW.h to 20 000 kJ/kW.h.

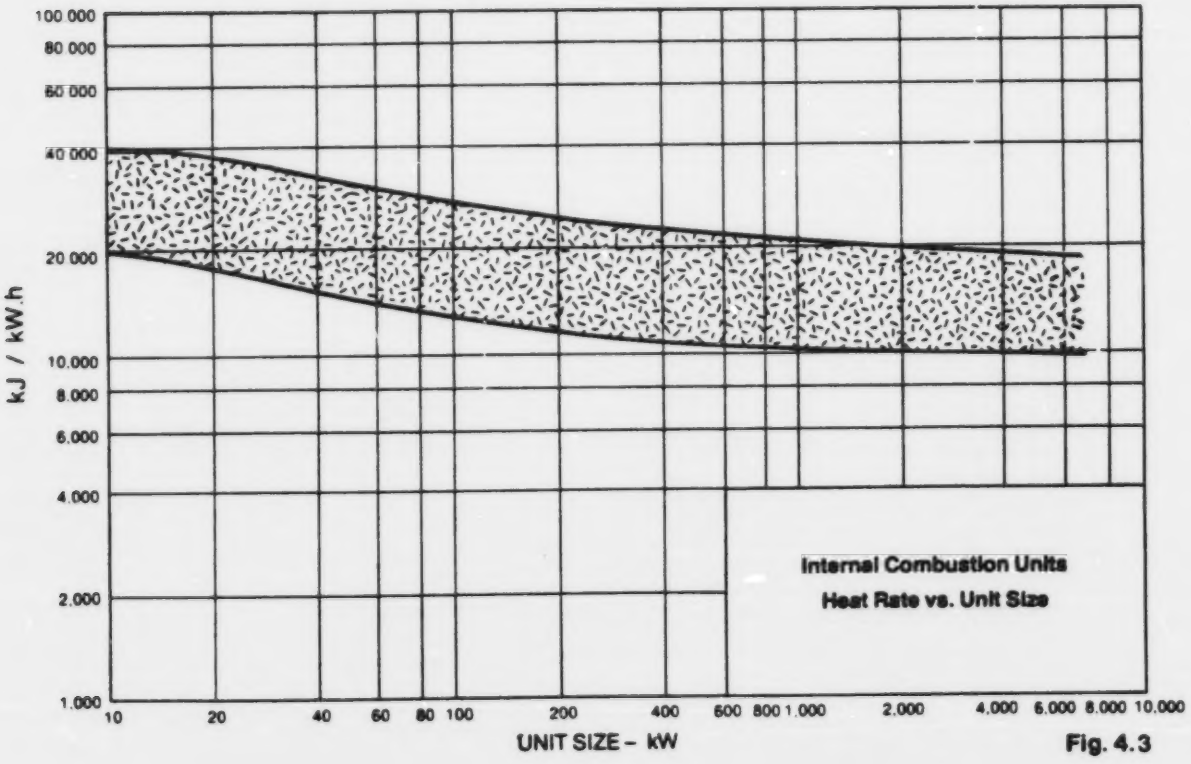

Fig. 4.3

5. CANADIAN AND PROVINCIAL TREND ANALYSIS 1984-1988

The previous sections deal with generation, fuel consumption and cost data for Canadian electrical utilities in the year 1988. This section reviews Canadian and provincial trends (including the Yukon and Northwest Territories) over the historical period 1984 to 1988. The data are based on previous reports in this series except for the data on industrial self-generation and total provincial consumption, which are based on Statistics Canada publications. The provincial consumption includes the total provincial generation plus purchases minus exports and inter-provincial sales. The difference between consumption and total generation is shown as a net inflow or net outflow.

5.1 Canada

Figure 5.1(a) shows the total energy generation and consumption figures for Canada during the period 1984 to 1988 inclusive. Total generation increased at a compound annual rate of 3.6 percent from 1984 to 1988 and increased 3.0 percent from 1987 to 1988. Total consumption increased 4.6 percent per annum in the five years leading up to 1988 and increased 5.3 percent in 1988. The gross exports of 34 TW.h in 1988 were down 28.3 percent from the level in 1987. This sudden decrease of export sales was largely attributable to a combination of dry weather conditions in Canada and increased demand in Canada. (1)

Figure 5.1 (b) illustrates the share of total generation by primary energy source. The nuclear and hydro combined share of total generation remained essentially unchanged in 1988 from 1987. However, due to low water levels in 1988, the hydro portion decreased by 3.9 percent. Nuclear generation increased its share by 4.2 percent in 1988. The coal component of the total share increased by 5.6 percent to 18.9 percent of the total. The use of oil and gas continued to be insignificant.

Figure 5.1(c) shows thermal energy generated by fuel type while Figure 5.1(d) shows the corresponding fuel cost (mills/kW.h) associated with each type over the review period. Also shown in Figure 5.1(d) is the average system fuel cost trend for Canada. The average system fuel cost was calculated by dividing the total electrical utilities' fuel costs for each year by the total generation including both thermal and hydro production. The average system fuel cost for each province is shown in the graphs in section 5.2 to 5.13 which follow. This trend gives an indication of the significance of the fuel cost component to the total system generation costs. From Figure 5.1(d) it can be seen that the average system fuel cost, which was 4.60 mills/kW.h during 1984, has decreased to 4.39 mills/kW.h in 1988. The decrease from 1987 to 1988 was 2.4 percent. The five-year decline is due to a drop in overall fossil fuel prices, especially oil, and the increasing use of hydro and nuclear generation.

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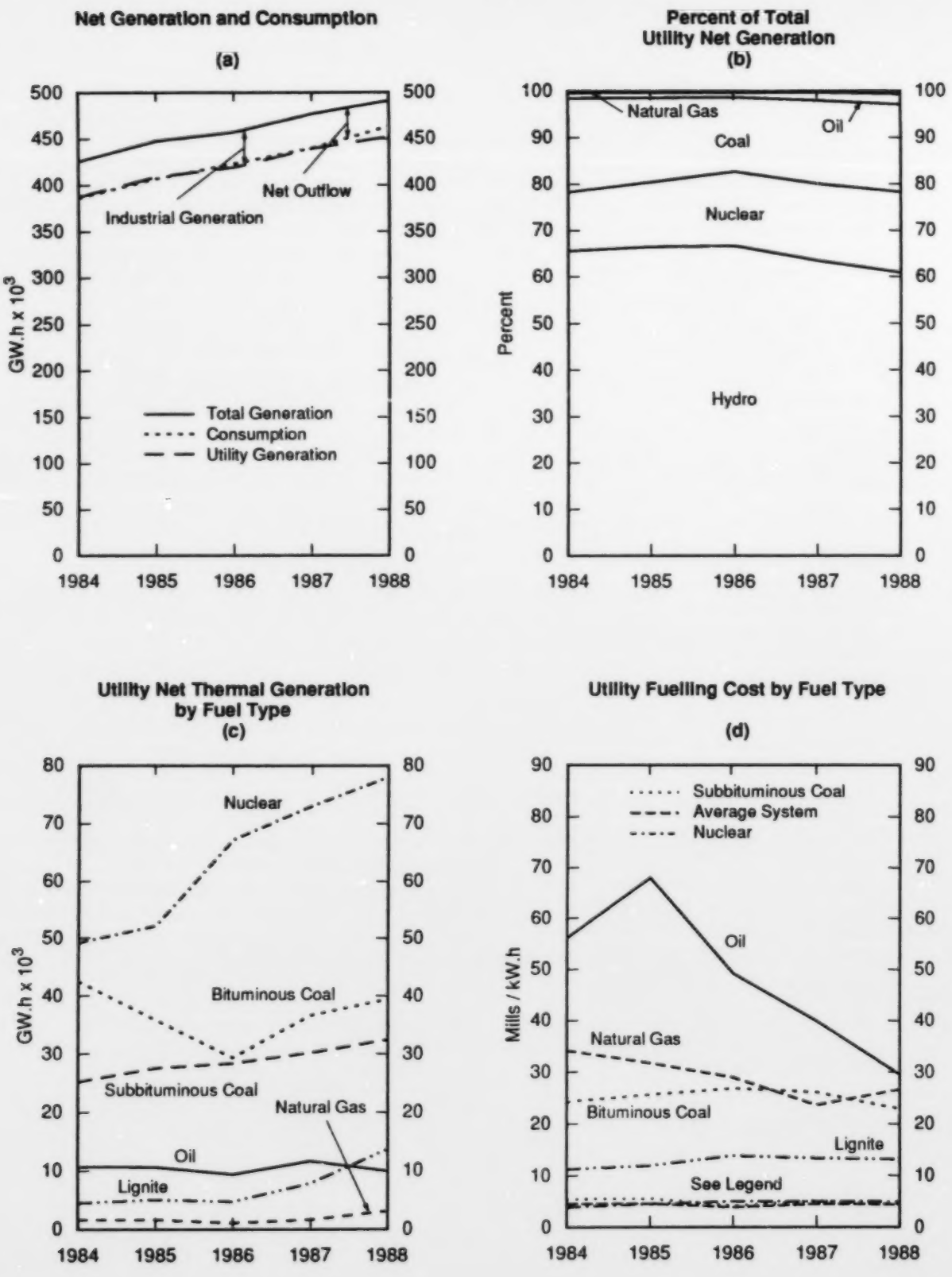
(1) In 1988, the exporting provinces of Manitoba, Québec and Ontario had unusually dry conditions; low reservoirs, coupled with increased demand, resulted in lower exports.

Fig. 5.1 Canada



It must be noted that the average system fuel cost for electric utilities in Canada includes a significant component of low cost nuclear generation priced at 4.9 mills/kW.h in 1988 and hydro generation which is assumed to be of zero fuel cost. Nuclear and hydro generation by electric utilities comprised approximately 78 percent of the total. The zero cost assumption for hydro does not take into account water usage charges or taxes which are levied in certain provinces.

5.2 Newfoundland

As shown in Figure 5.2(a), electric utilities' net generation for 1988 in Newfoundland, at 40 736 GW.h, was up from the 1987 level of 38 789 GW.h. This increase is attributable to an increase in the amount of hydro energy generated from the Churchill Falls plant and other hydro plants in Newfoundland. The energy generated from Churchill Falls is shown as a net outflow in Figure 5.2 (a). Consumption within the province has increased steadily since 1984. The increase from 1984 to 1988 was 1.7 percent. The increase in 1988 from 1987 was 4.7 percent.

Excluding Labrador, hydro-electric generation accounted for 77 percent of Newfoundland's total electricity supply in 1988. The balance was supplied from oil-fired facilities. Newfoundland relies on oil-fired generation to make up the difference between total provincial demand and the variable supply available from hydro generation on the island. This variability, due to the limited hydro storage capacity available and annual changes in rainfall, explains the fluctuations in oil consumption illustrated in Figure 5.2(c).

Excluding the Churchill Falls generation in Labrador, the average system fuel cost decreased to 16.1 mills/kW.h in 1988 from 16.4 mills/kW.h in 1987. This was due to the increased availability of hydro on the Newfoundland system. The average system cost, excluding Churchill Falls, over the five year period to 1988 has varied, depending on hydro availability and the burning of oil to generate electricity.

5.3 Prince Edward Island

All of Prince Edward Island's on-island generation is oil-fired. The province's major utility, Maritime Electric, purchased a capacity participation in the New Brunswick Electric Power Commission's [NBEPC] Dalhousie # 2 coal-fired unit, and the island's consumption is now almost totally supplied by this arrangement and by purchases of energy from NBEPC, over an underwater cable interconnection. The Interconnection Agreement (signed in 1981) is for 30 years.

In 1988, the island's electricity consumption was 691 GW.h, a 6.5- percent increase from the previous year. Of this, 85 GW.h was generated on the island. In 1987, the on-island generation was 58 GW.h. However, the higher on-island demand in 1988 combined with reduced availability of electricity from New Brunswick and lower world oil prices, has led to an increase in the on-island generation . The average system cost for on-island generation in 1988 was 57.97 mills/KW, a decrease of 18.6 percent from the previous year. The average system plotted line in Figure 5.3 (d) is oil, the only fuel used by the island utility.

Fig. 5.2 Newfoundland

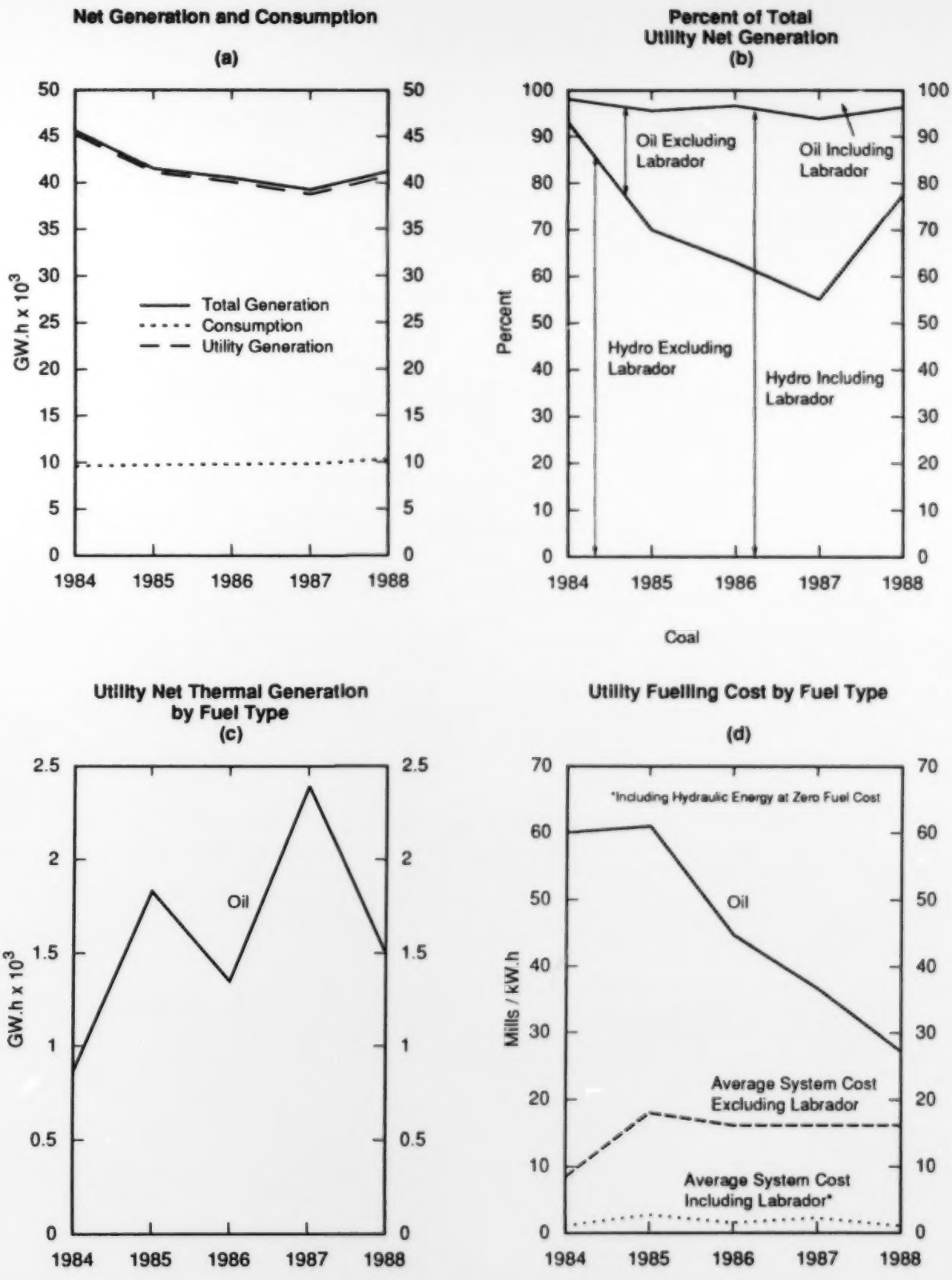
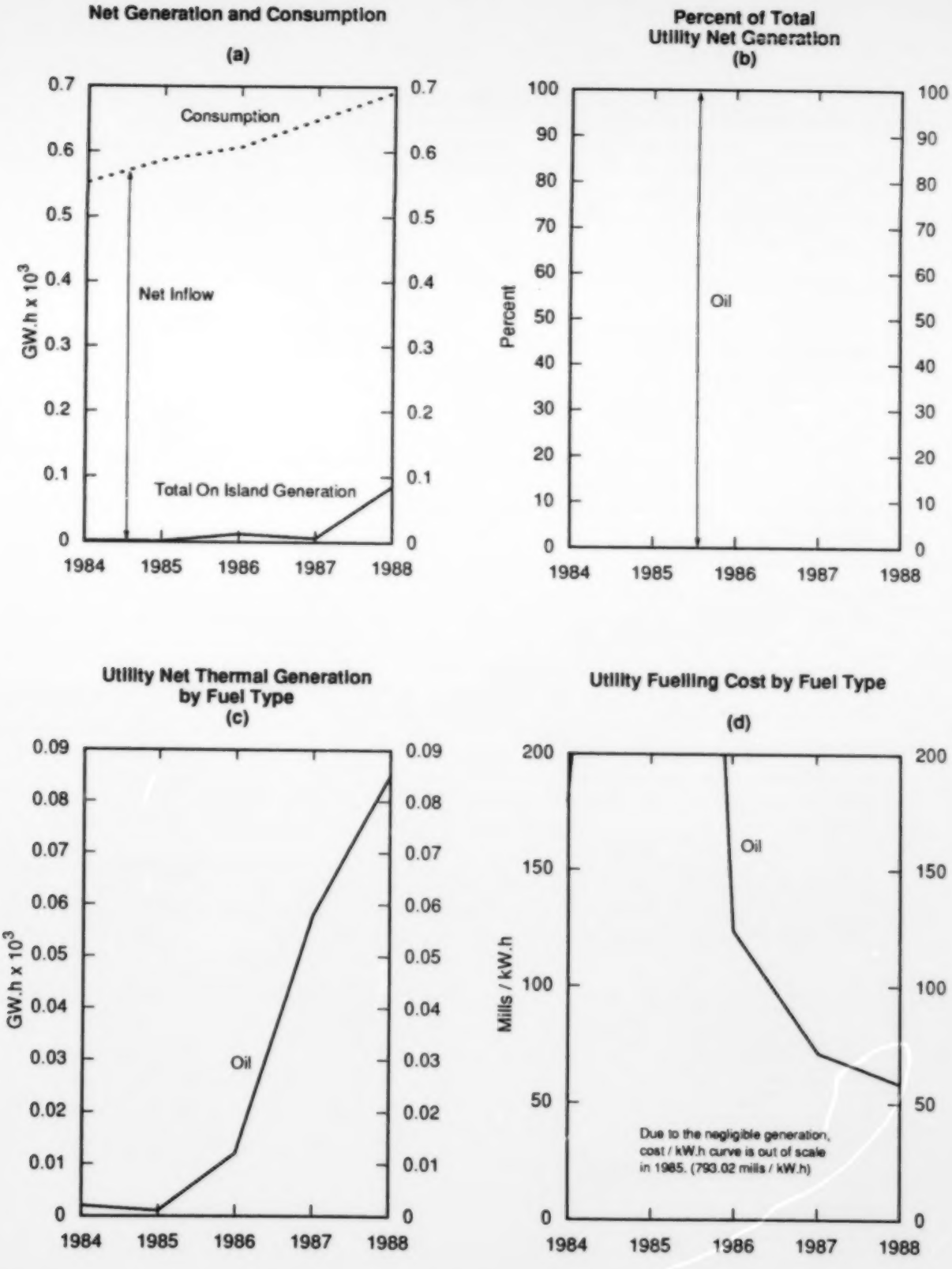


Fig. 5.3 Prince Edward Island



5.4 Nova Scotia

As shown in Figure 5.4(a), net utility generation increased approximately 15.5 percent from 1987 to 1988 to 8 512 GW.h and purchases from New Brunswick made up the difference to meet total consumption. Figures 5.4(b) and 5.4(c) show that the province continues its use of indigenous coal resources to reduce its dependence on oil-fired generation. In 1988, 69 percent of total generation was produced using coal. Nova Scotia was able to slightly increase its hydro production to 12.6 percent in 1988 from 9.8 percent of the total share in 1987.

Total consumption increased from 7 267 GW.h in 1984 to 8 910 GW.h in 1988, an average annual rate of increase of 5.2 percent. The 1988 increase over 1987 was 7.0 percent.

The average system fuel cost decreased from 26.4 mills/kW.h in 1987 to 24.6 mills/kW.h in 1988. This decrease in the average system fuel cost is mainly attributable to the decrease in the world oil price.

5.5 New Brunswick

As shown in Figure 5.5(a), net utility generation increased 27.8 percent in 1988 from 11 810 GW.h in 1987 to 15 192 GW.h in 1988. In-province consumption increased 3.0 percent in 1988 to 12 698 GW.h. The balance of in-province consumption was met by purchases from Hydro-Québec.

Figure 5.5(b) shows that approximately 48 percent of total utility net generation was coal- and oil-fired in 1988, compared to 39 percent in 1987. This increase is attributable to the reduced availability of hydro resources in 1988. The largest share of total in-province generation in 1988 was oil at 37 percent followed by nuclear generation at 35 percent. A combination of a cold winter, increased demand, and a tight system (considerably less energy purchases from Québec) with favourable oil prices resulted in increased consumption of oil to generate electricity in 1988.

Export sales in 1988 were 5 191 GW.h, down from 6 141 GW.h in 1987, while purchases from Hydro-Québec were 3 132 GW.h, down from 6 913 in 1987. Interprovincial sales totalled approximately 1 365 GW.h in 1988. This is shown as a net outflow in Figure 5.5(a).

Although New Brunswick increased its consumption of oil to offset the decreased purchases of energy from Hydro-Québec, the decreased price of oil more than compensated for this in New Brunswick's average system fuel cost. The average system fuel cost in 1988 was 12.0 mills/kW.h, down from the previous year of 13.8 mills/kW.h.

Fig. 5.4 Nova Scotia

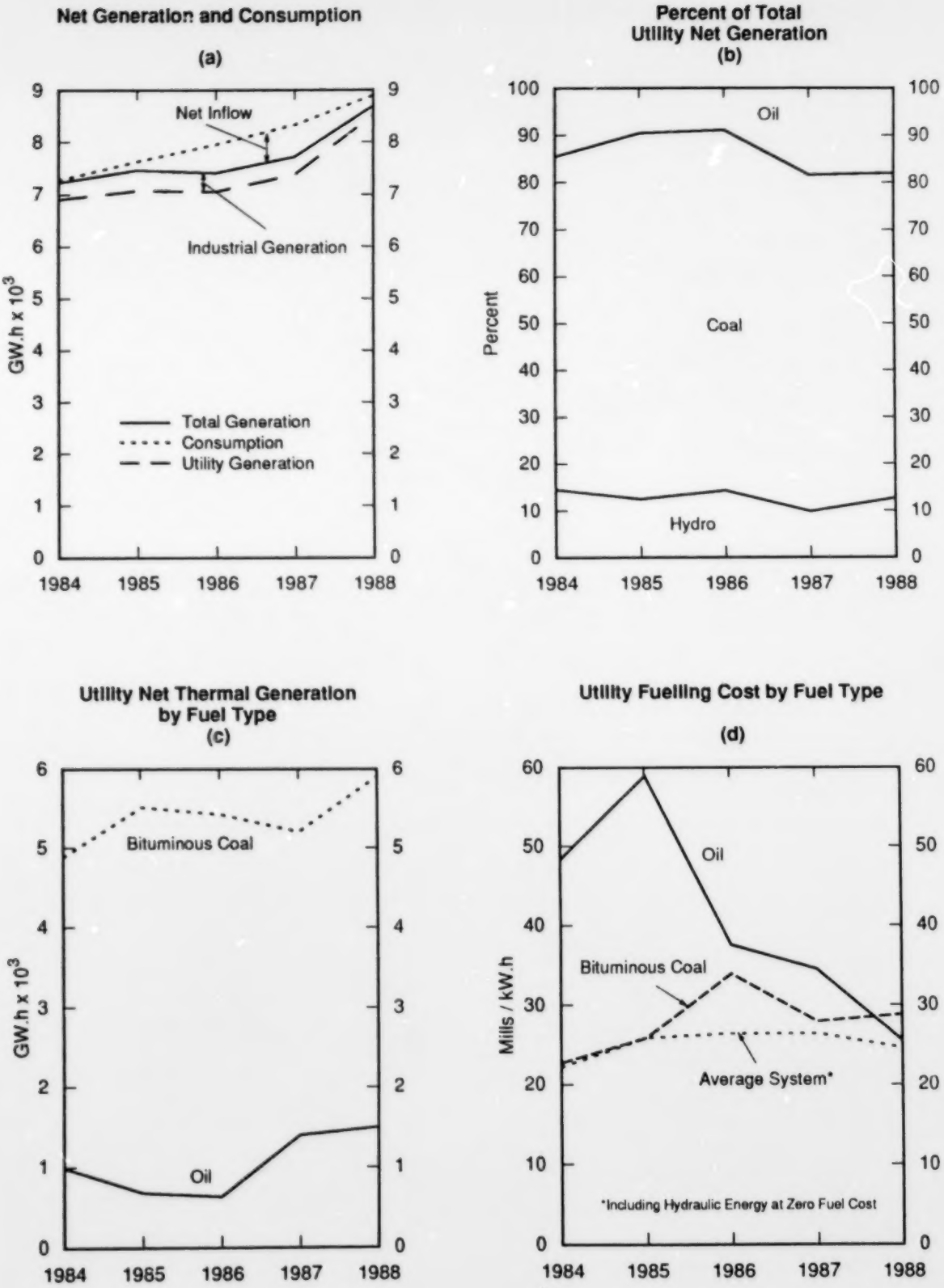
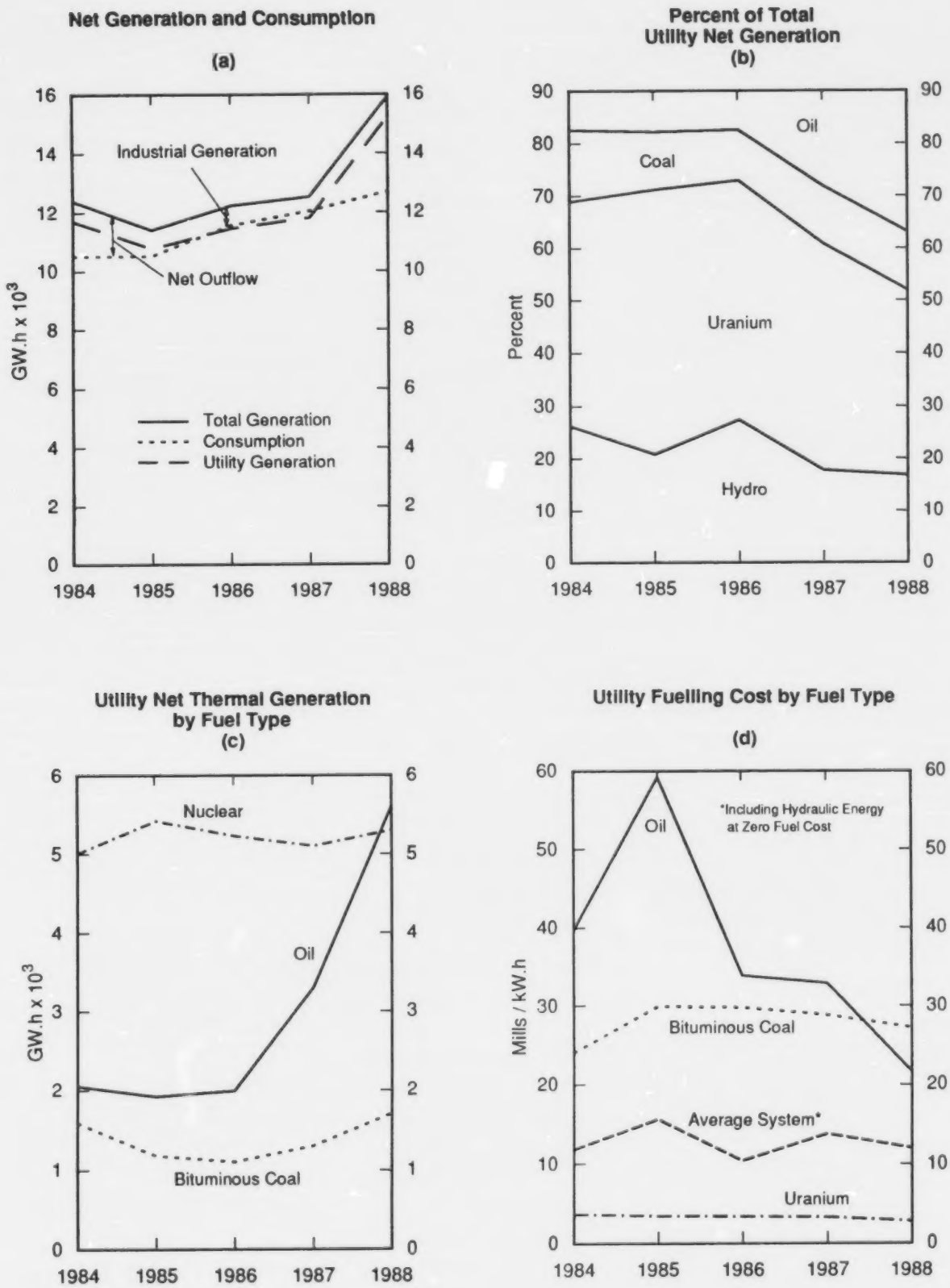


Fig. 5.5 New Brunswick



5.6 Québec

As shown in Figure 5.6 (a), net electric utility generation in Québec decreased by 3.4 percent in 1988 to 132 495 from 137 150 GW.h in 1987. Figures 5.6 (b) and 5.6 (c) illustrate that virtually all of the energy generated in the province is hydro-based. Oil is used primarily in peaking facilities and in isolated locations. Nuclear generation is also shown for the Gentilly II reactor, Québec's only operating nuclear power facility.

In 1988, in-province consumption increased to 164 000 GW.h from 159 160 GW.h in 1987, an increase of 3.1 percent. The average annual rate of growth in consumption since 1984 is 4.9 percent.

Figure 5.6 (a) also shows a net inflow of electricity from outside the province. This is due to Hydro-Québec's purchase of 30 702 GW.h in 1988 from Churchill Falls in Labrador and approximately 4 000 GW.h from other neighbouring systems. Québec exported 11 863 GW.h of energy to the United States in 1988 compared with 16 401 GW.h in 1987, a reduction of 28 percent. Québec sold a total of 5 258 GW.h to Ontario and New Brunswick in 1988, a decrease of 62 percent from the previous year. Extreme dry weather conditions in 1988 in Québec resulted in Hydro-Québec decreasing its exports and interprovincial sales and increasing purchases from neighbouring utilities to meet its domestic load.

The average system fuel cost of electricity generation, assuming a zero cost for hydro, was negligible.

5.7 Ontario

Figure 5.7 (a) shows that, in 1988, net utility generation increased 9.7 percent to 138 951 GW.h from 126 682 GW.h in 1987. Figure 5.7 (b) illustrates that, in 1988, the nuclear share of total electrical energy generation remained at approximately 50 perent, the largest single source of generation. The coal-fired generation share also remained at 25 percent of the total compared with the previous year. Most of the economic hydro resources in Ontario have been developed. As a result, most major new facilities are either nuclear or coal-fired.

Total consumption of electricity increased to 140 948 GW.h in 1988 from 132 500 GW.h in 1987, an increase of 6.4 percent. Ontario exported 7 439 GW.h in 1988, down from 8 497 GW.h in 1987. Purchases from Québec and Manitoba totalled 2 832 GW.h in 1988 and imports from the United States were 2 491 GW.h.

The average system fuel cost in 1988 was 8.2 mills/kW.h, down from 9.2 mills/kW.h in 1987 and 9.4 mills/kW.h in 1984. A significant contributor to this low cost was the nuclear fuel component at a cost of 5.2 mills/kW.h in 1988.

Fig. 5.6 Québec

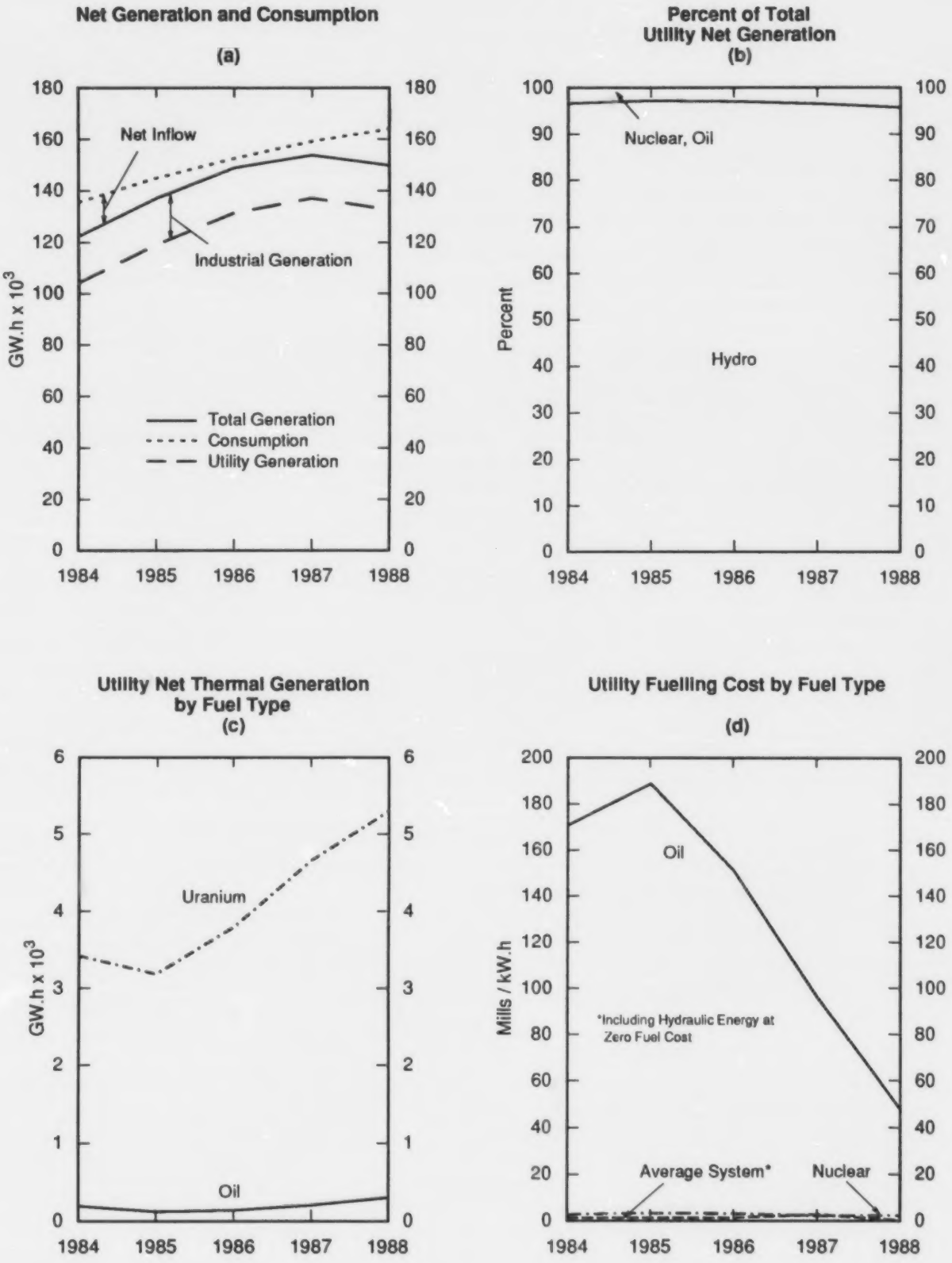
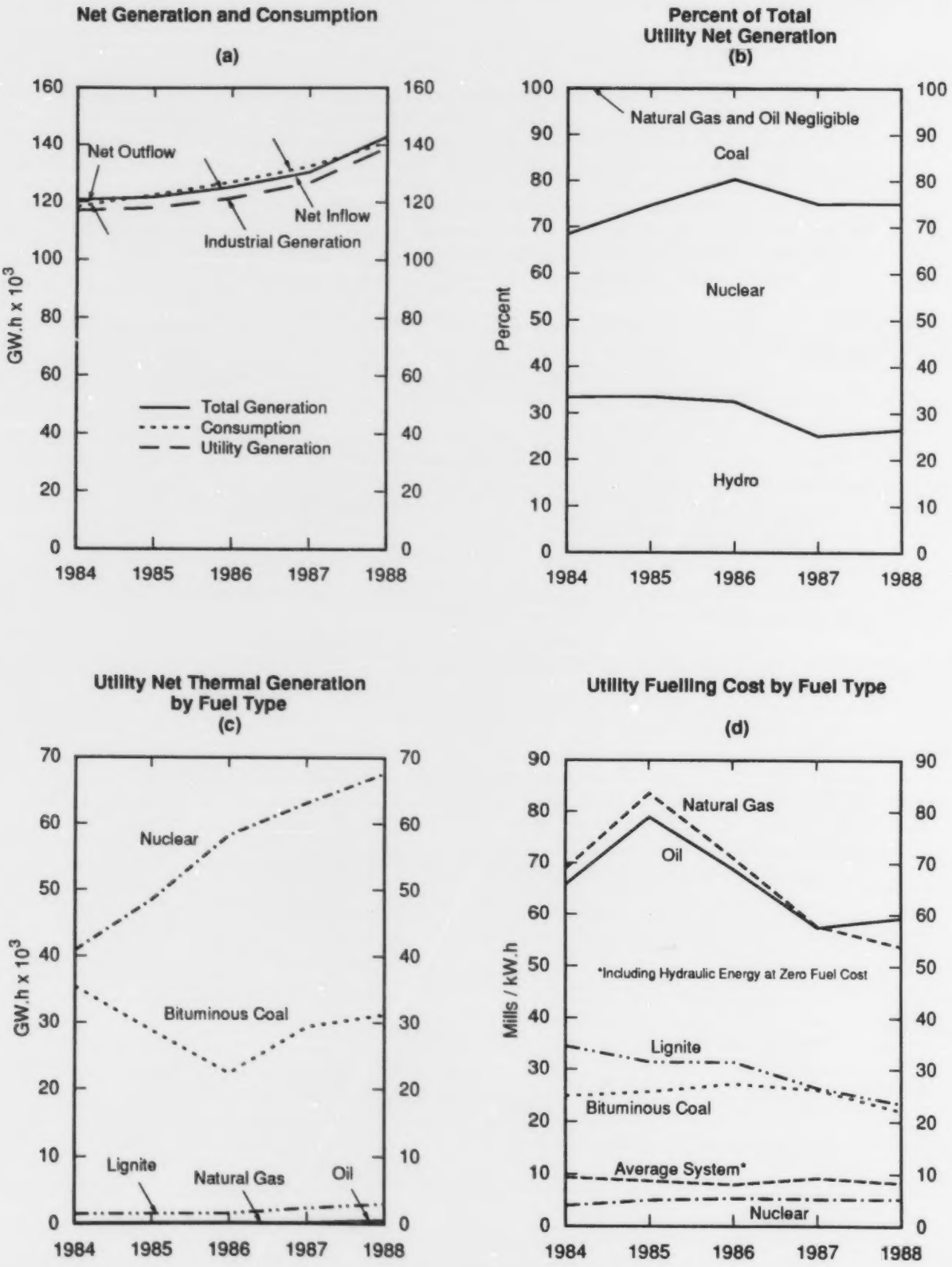


Fig. 5.7 Ontario



5.8 Manitoba

Figure 5.8 (a) shows that net utility generation in Manitoba decreased from 19 850 GW.h in 1987 to 16 260 GW.h in 1988. This decrease is due to the continuing drought which affected the province. Virtually all of the energy was produced from hydro resources. Figure 5.8 (b) shows that fossil fuels increased to approximately 5 percent of total generation.

Total in-province consumption increased to 16 870 GW.h in 1988 from 15 860 in 1987, an increase of 6.4 percent. Export sales decreased to 629 GW.h in 1988 from 3 461 GW.h in 1987, a decrease of 82 percent. Due to dry weather conditions and the increase in in-province demand, exports had to be reduced to meet the in-province load.

The average system fuel cost was insignificant since hydro is included at zero cost and fossil fuels were hardly used.

5.9 Saskatchewan

As shown in Figure 5.9 (a), utility net generation increased to 12 620 GW.h in 1988 from 12 100 GW.h in 1987. Due to continued dry weather, water flows on the Saskatchewan River system decreased in 1988. These decreased flows increased the total requirement for coal-fired generation to 77 percent of total generation in 1988 from 73 percent in 1987. Hydroelectric production in 1988 decreased to 19 percent of the net utility generation from 26 percent of the total in 1987. Lignite and subbitumious coal continued to be the major source of electricity in the province, accounting for 77 percent of the total, as shown in Figure 5.9 (b). Gross exports totalled 57 GW.h in 1988, but were offset by energy purchases from Manitoba and some imports, resulting in a net inflow.

In-province consumption increased from 12 500 GW.h in 1987 to 13 470 GW.h in 1988, an increase of 7.8 percent. The five-year annually compounded growth rate to 1988 was 3.3 percent.

In 1988, the average system fuel cost was 8.4 mills/kW.h, up from 7.5 mills/kW.h in 1987. This low average cost was due to the heavy reliance on inexpensive sources of indigenous lignite. However, the increase in 1988 over the previous year was due to the 5-percent increase in the share of total generation made up by natural gas burns to generate electricity at a cost of 32.1 mills/kW.h. Oil was also used for electricity generation, but the amount used was insignificant and is not shown in Figure 5.4 (d).

Fig. 5.8 Manitoba

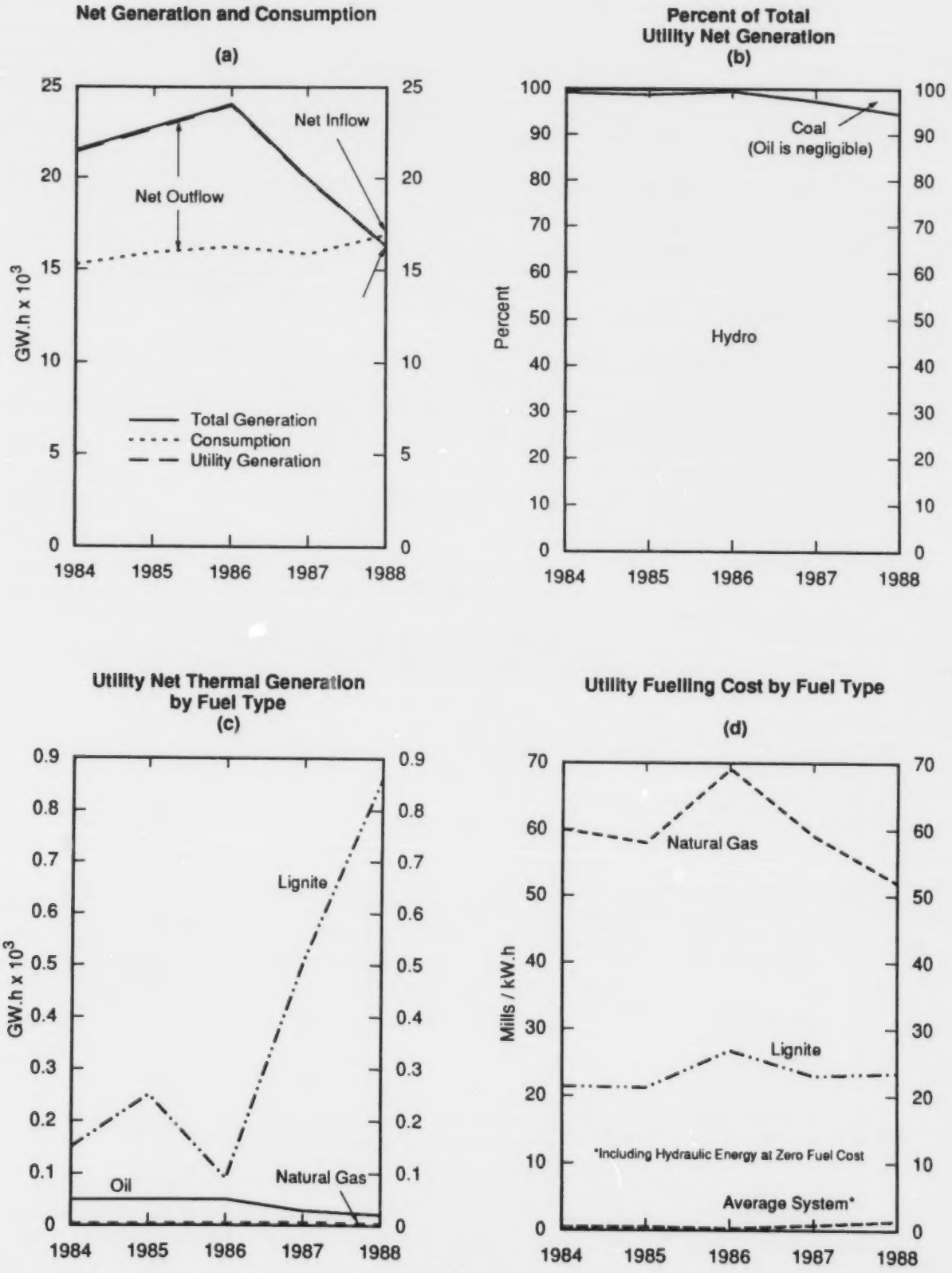
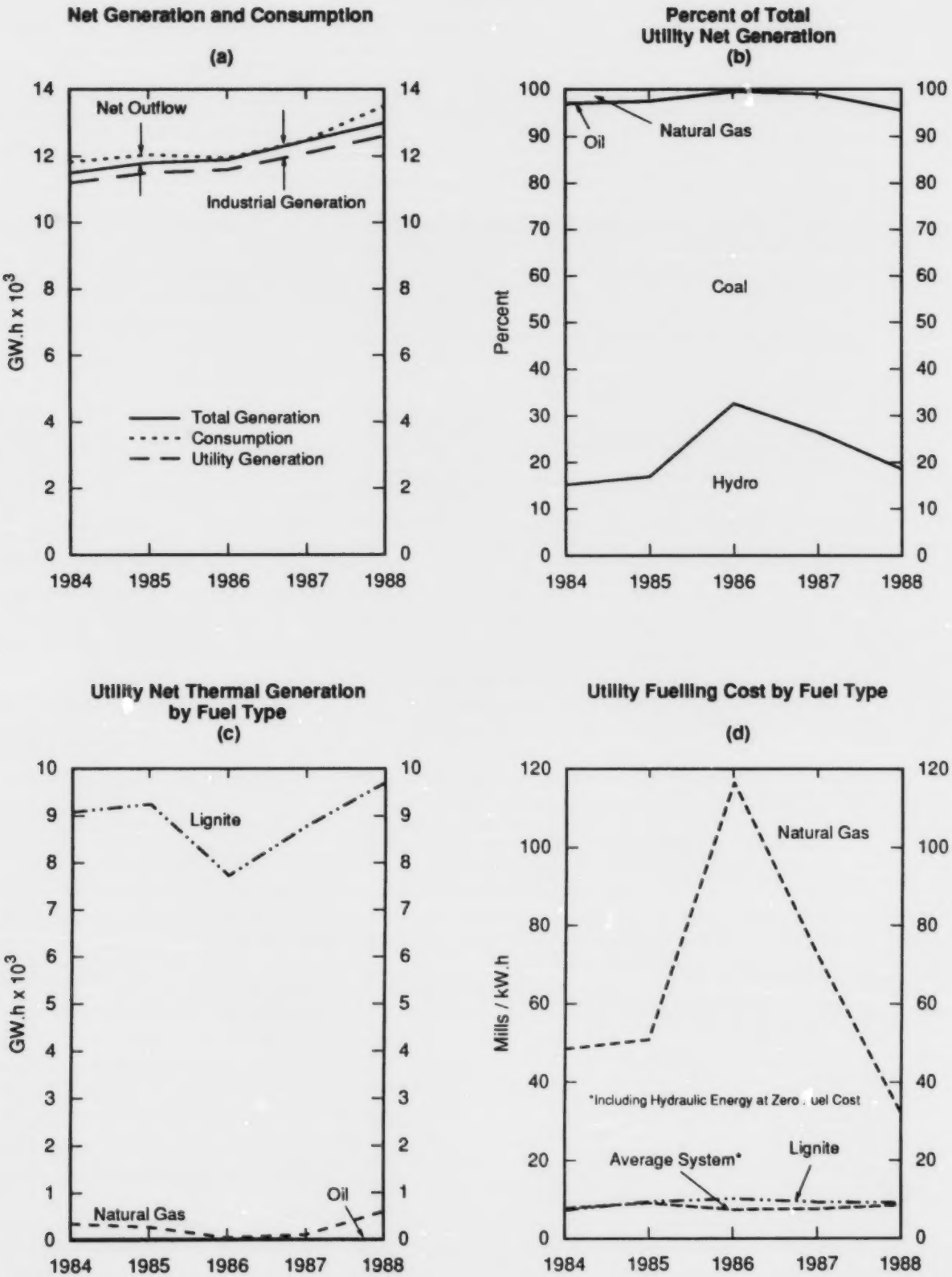


Fig. 5.9 Saskatchewan



5.10 Alberta

As shown in Figure 5.10 (a), electrical utilities' net generation increased from 36 900 GW.h in 1987 to 36 900 GW.h in 1988, an increase of 9.8 percent. In-province consumption increased from 36 500 GW.h in 1987 to 39 400 GW.h in 1988, an increase of 8.0 percent. During the five-year period to 1988, in-province consumption rose at an annually compounded rate of 6.0 percent.

Figure 5.10(b) shows that electricity generation from coal decreased to 90 percent of the total share. However, natural gas consumption to generate electricity almost doubled its share to 6 percent of the total generation.

The average system fuel cost in 1988 was 5.4 mills/kW.h, down slightly from the previous year of 5.5 mills/kW.h. This low average system cost is primarily due to the extensive use of inexpensively extracted indigenous coal resources, and vertical integration in the coal mining and power generation industries.

5.11 British Columbia

As shown in Figure 5.11 (a), electric utilities' net generation decreased to 49 100 GW.h in 1988 from 50 600 in 1987, a decrease of 3.0 percent. This decrease in net generation is due to a low water year and resulted in a decrease in total exports from 12 815 GW.h in 1987 to 8 851 GW.h in 1988. As shown in Figure 5.11(b), 99.6 percent of total generation in 1988 was hydroelectric, virtually unchanged from the previous five years.

In-province consumption increased to 54 300 GW.h in 1988 from 51 400 GW.h in 1987, an increase of 5.6 percent. The five-year average annually compounded rate to 1988 was 4.5 percent.

The average system fuel cost, illustrated in Figure 5.11 (d) was negligible, given the zero cost attributed to hydro sources and the limited use of fossil fuels.

Fig. 5.10 Alberta

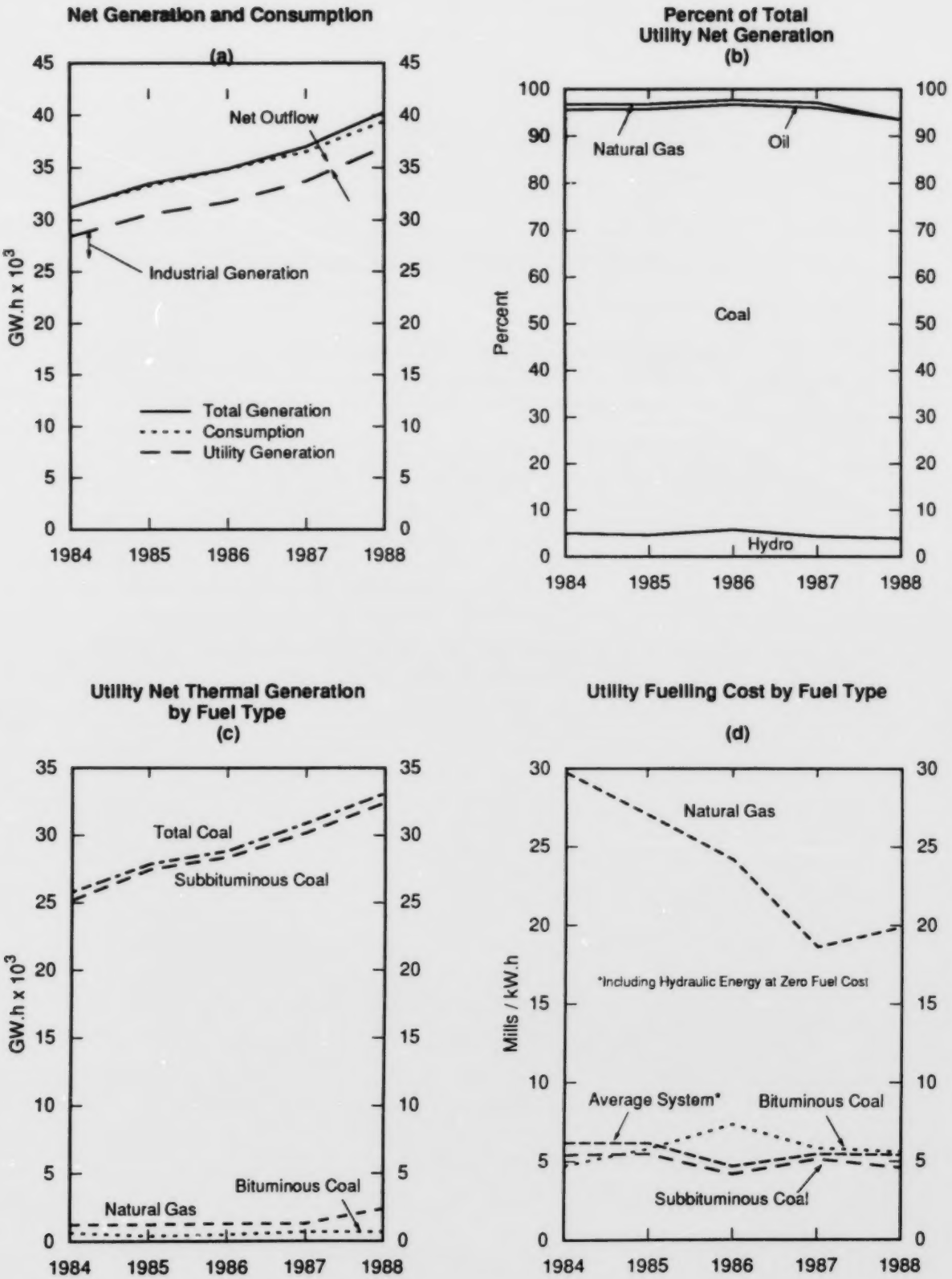
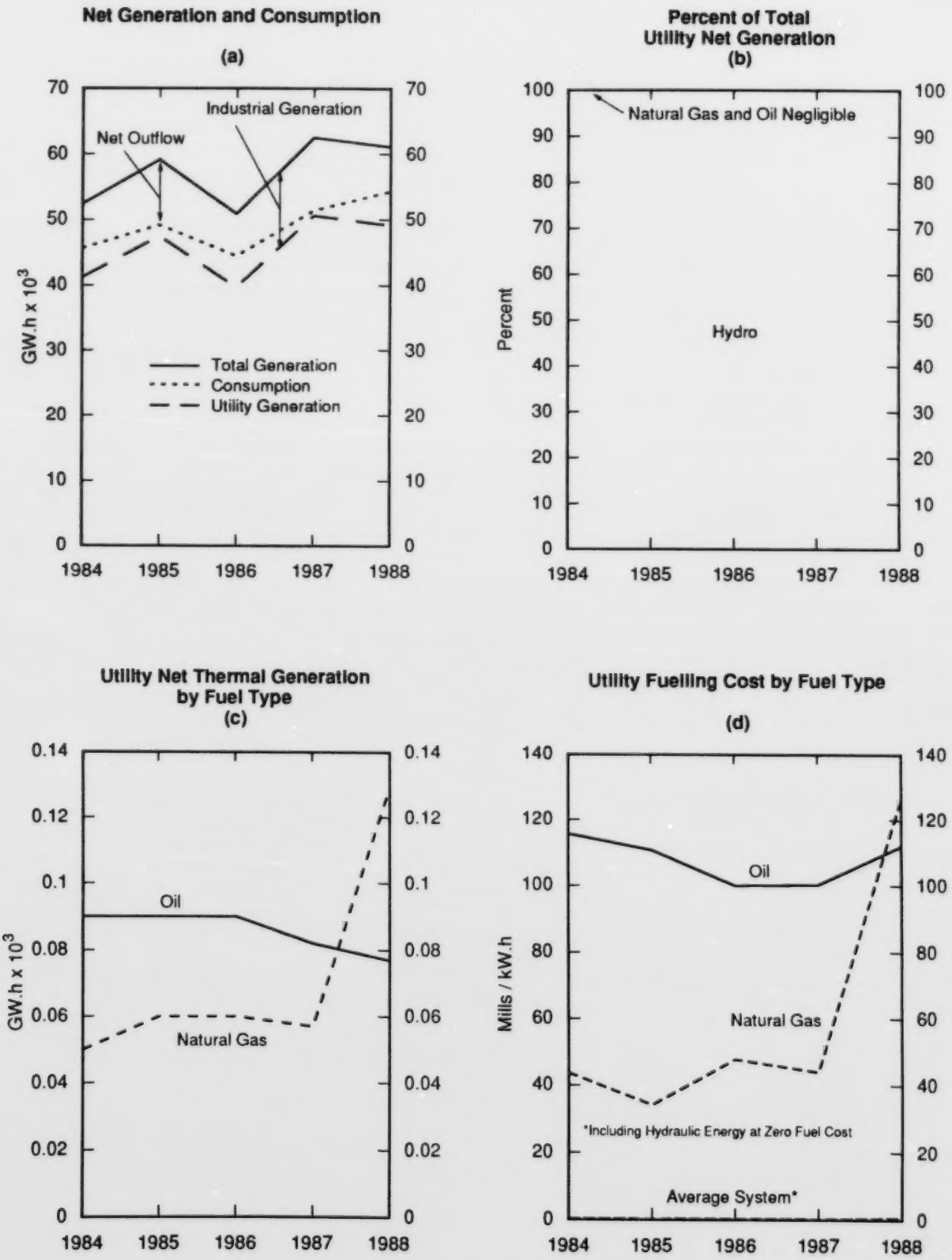


Fig. 5.11 British Columbia



5.12 Yukon

Figure 5.12 (a) shows that in 1988 total generation and consumption increased to 439 GW.h from 427 GW.h in 1987, an increase of 2.8 percent. No industrial self-generation of electricity has been reported since 1979. Figure 5.12 (b) shows that approximately 93 percent of total generation is from hydro sources.

The average system fuel cost in 1988 was 5.4 mills/kW.h, up slightly from 5.3 mills/kW.h in 1987 and down from 10.3 mills/kW.h in 1984. The reduction in the average system fuel cost over the period since 1984 was largely due to the increased use of hydro generation which replaced the more expensive oil-fired generation in the interconnected system around Whitehorse. Isolated communities in Yukon rely solely on oil-fired internal combustion units for which fuel costs have been in excess of 100 mills/kW.h in years previous to 1987, although lower world prices for oil reduced generation costs for oil-fired combustion units to 95.2 mills/kW.h in 1987 and 78.7 mills/KW.h in 1988.

5.13 Northwest Territories

As shown in Figure 5.13 (a), total in-territory generation decreased to 435 GW.h in 1988 from 538 GW.h in 1987, a decrease of 19 percent. As shown in Figure 5.13 (b), approximately 59 percent of total generation was provided by hydro facilities in 1988, virtually unchanged from the previous year. The balance of the supply was from the oil-fired internal combustion units located mainly in isolated communities.

Consumption increased steadily from 439 GW.h in 1983 to 618 in 1986, after which it decreased to 538 GW.h in 1987. Consumption increased in 1988 to 549 GW.h, an increase of 2.0 percent over the previous year.

The average system fuel cost in 1988 was 57.4 mills/kW.h, up from 48.3 mills/kW.h in 1987, an increase of 18.8 percent. Many isolated communities were served solely by oil-fired internal combustion units for which fuel costs exceeded 100 mills/kW.h.

Fig. 5.12 Yukon

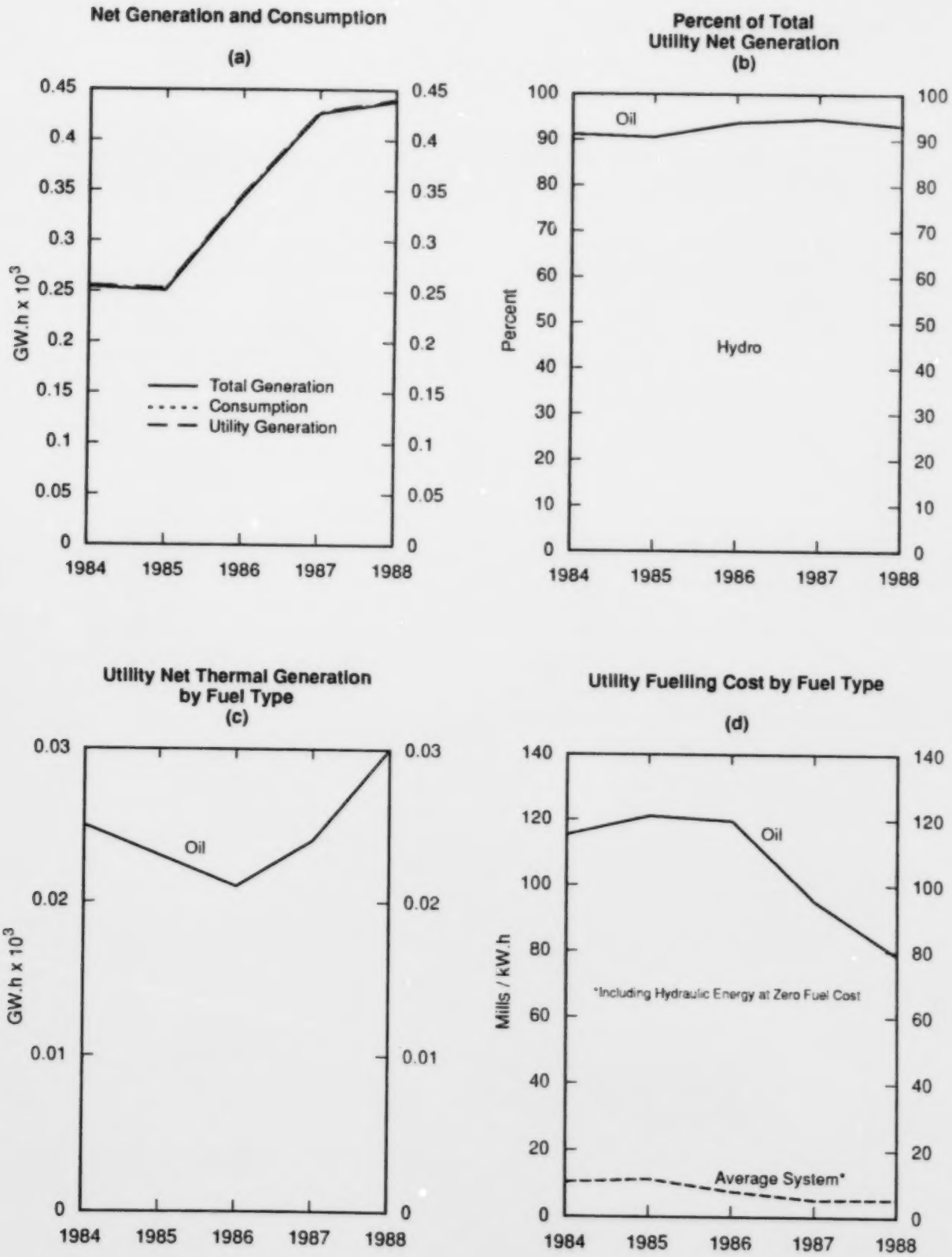
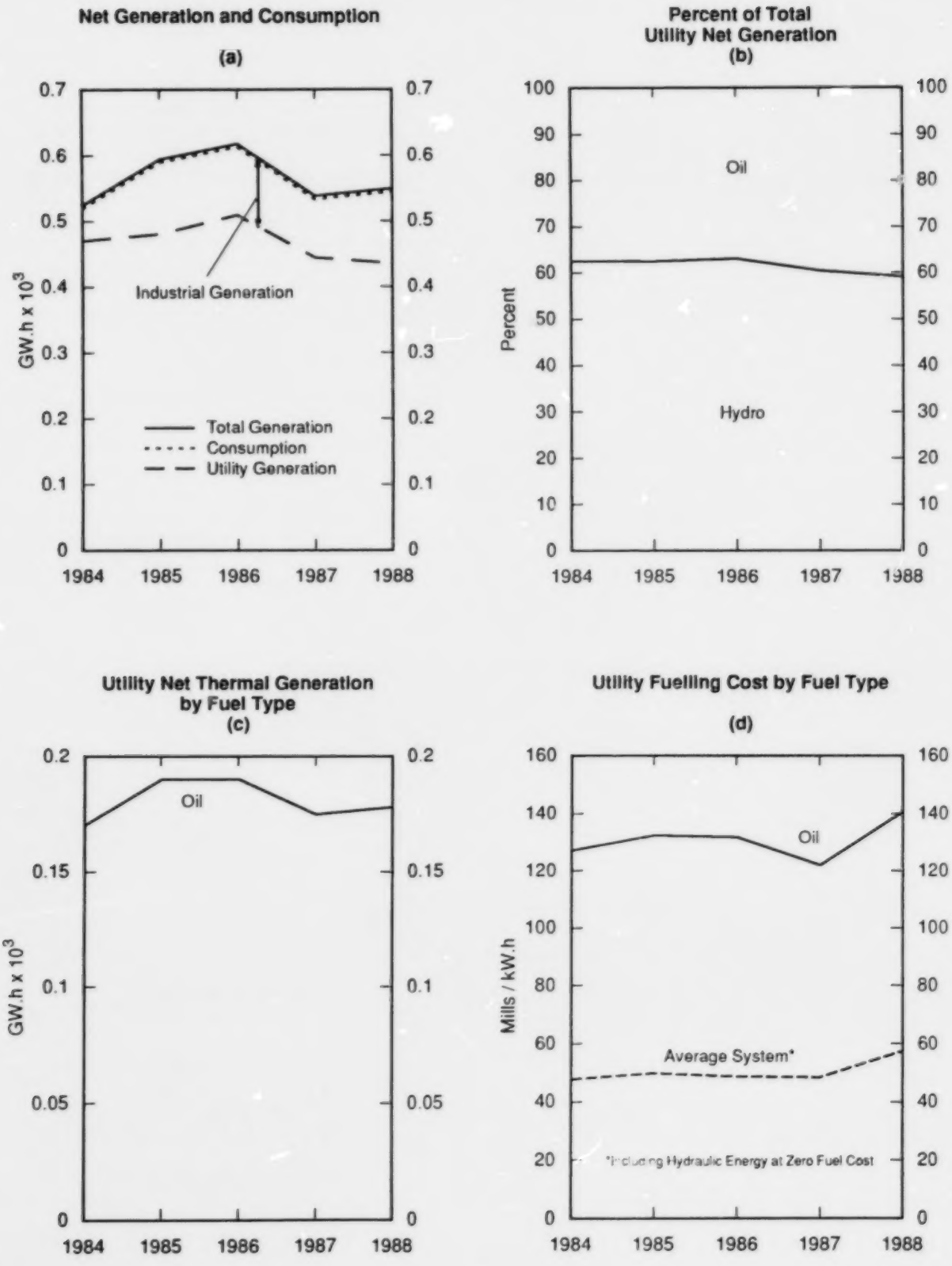


Fig. 5.13 Northwest Territories



6. CANADIAN POPULATION, GROSS NATIONAL PRODUCT AND ELECTRICITY GENERATION TRENDS - 1961 - 1987

In Canada, as in other industrialized nations, there is a fundamental linkage between electricity demand and economic activity. Accordingly, we present a historical perspective of this relationship in Canada. Figure 6.1 shows Canadian electrical consumption per capita plotted against real Gross National Product (GNP) per capita.

The Board has noted other studies that indicate that there is a relationship between electrical energy consumption per capita and real Gross National Product (GNP) per capita. Accordingly, as a matter of interest, an analysis of this relationship for Canada follows.

Table 6.A provides data on electrical energy consumption, real GNP and population for 1961 to 1988. The average annually compounded growth rates are about 6.8 percent, 5.5 percent and 1.7 percent, respectively, for the period 1961 to 1970 inclusive and 5.4 percent, 3.8 percent and 1.2 percent, respectively, for the period 1971 to 1980. The five-year period to 1988 showed average annually compounded growth rates of 4.6 percent, 4.1 percent, and 0.9 percent respectively. Figure 6.1 illustrates the relationship between per capita electricity consumption and per capita real GNP.

Table 6.B provides data on the behaviour of the real average price of electricity between 1970 and 1988 (1971 $). The long-term trend exhibited a steady decline until 1974 and an increasing trend to 1979. After leveling off during 1979 and 1980, the average price dropped to 13.3 mills/kW.h (1971 $) in 1981 and rose steadily to 14.3 mills/kW.h in 1985. The average selling price dropped to 13.5 mills/kW.h in 1986 and to 13.2 mills/kW.h in 1988. Over the eleven-year period to 1988, the real price of electricity was relatively constant at about 13.8 mills/kW.h $\pm$ 0.5 mills.

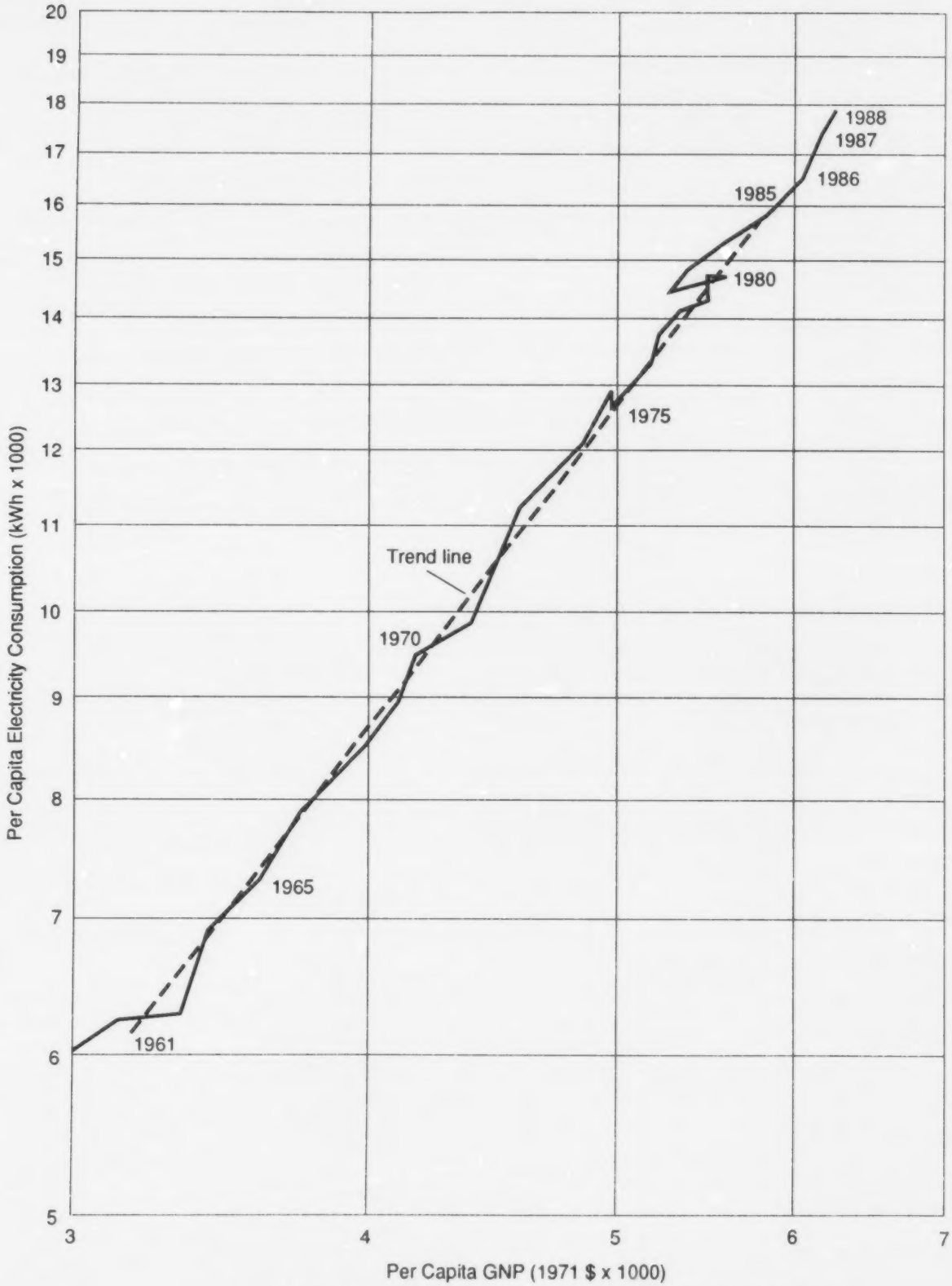


Fig. 6.1 Per Capita Electricity Consumption vs. per Capita GNP

TABLE 6.A

GNP, ELECTRICAL ENERGY CONSUMPTION AND POPULATION FOR CANADA

YEAR	GNP ('000 000 1971$)	ELEC.(*) CONSUMPTION ('000 000 Kw.h)	POPULATION ('000 000)	GNP/CAPITA (1971$)	CONSUMPTION/ CAPITA (kW.h)
1961	54.741	110.950	18.238	3001.5	6083.5
1962	58.473	116.135	18.583	3146.6	6249.5
1963	62.486	121.510	18.931	3300.7	6418.6
1964	65.610	133.949	19.290	3401.2	6944.0
1965	69.981	144.165	19.644	3562.5	7338.9
1966	74.844	156.956	20.015	3739.4	7841.9
1967	77.344	165.812	20.378	3795.5	8136.8
1968	81.864	175.849	20.701	3954.6	8494.7
1969	86.225	188.648	21.001	4105.8	8982.8
1970	88.390	201.298	21.297	4150.3	9451.9
1971	94.450	211.492	21.568	4379.2	9805.8
1972	100.248	231.557	21.802	4598.1	10620.9
1973	107.812	249.298	22.042	4891.1	11310.1
1974	111.687	267.298	22.364	4993.7	11952.2
1975	113.005	265.995	22.697	4978.9	11717.6
1976	119.612	284.829	22.993	5202.1	12387.6
1977	121.988	299.929	23.273	5241.6	12887.4
1978	126.347	316.827	23.517	5372.6	13472.3
1979	130.362	323.469	23.747	5489.6	13621.4
1980	131.765	340.068	24.043	5480.4	14144.2
1981	136.108	346.332	24.342	5591.5	14277.8
1982	130.065	345.437	24.583	5290.9	14051.9
1983	134.361	359.751	24.787	5420.6	14513.7
1984	141.097	386.322	24.979	5648.6	15465.9
1985	146.908	406.859	25.165	5837.8	16167.7
1986	151.446	432.029	25.353	5973.5	17040.5
1987	158.810	439.599	25.617	6199.4	17160.4
1988	165.485	462.948	25.912	6386.4	17866.2

(*) Total made available in Canada.

TABLE 6.B

AVERAGE SELLING PRICE OF ELECTRICITY

YEAR	REVENUE '000 000	SALES(*) '000 000 kW.h	MILLS/kW.h (CURRENT $)	C.P.I.(**) DEFLATOR	MILLS/kW.h (1971 $)
1970	1 716	137 972	12.4	0.972	12.8
1971	1 878	147 203	12.8	1.000	12.8
1972	2 065	162 729	12.7	1.048	12.1
1973	2 326	177 724	13.1	1.127	11.6
1974	2 677	193 329	13.8	1.250	11.0
1975	3 114	194 571	16.0	1.385	11.6
1976	3 852	213 612	18.0	1.489	12.1
1977	4 842	226 004	21.4	1.608	13.3
1978	5 612	235 975	23.8	1.752	13.6
1979	6 425	245 537	26.2	1.912	13.7
1980	7 355	254 684	28.9	2.106	13.7
1981	8 371	265 930	31.5	2.369	13.3
1982	9 684	264 289	36.6	2.625	13.9
1983	10 722	272 555	39.3	2.777	14.2
1984	12 150	295 852	41.1	2.898	14.2
1985	13 437	312 773	43.0	3.014	14.3
1986	14 853	350 134	42.4	3.137	13.5
1987	15 955	366 575	43.5	3.275	13.3
1988	17 427	386 392	45.1	3.408	13.2

(*) Total sales to ultimate customers.

(**) C.P.I. Deflator in 1971$.

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Appendix

TABLE 1.1

ELECTRIC UTILITIES
PROVINCIAL INSTALLED CAPACITY AND GENERATION
BY PRIMARY ENERGY SOURCE
1988

PROVINCE OR TERRITORY	FOSSIL FUELLED		NUCLEAR		HYDROELECTRIC		TOTAL	
	MW	GW.h	MW	GW.h	MW	GW.h	MW	GW.h
NEWFOUNDLAND	746.4	1513.6	0.0	0.0	6571.4	39222.3	7317.8	40735.8
PRINCE EDWARD ISLAND	122.1	85.1	0.0	0.0	0.0	0.0	122.1	85.1
NOVA SCOTIA	1722.3	7440.4	0.0	0.0	381.4	1071.3	2103.7	8511.7
NEW BRUNSWICK	1770.6	7295.6	680.0	5341.7	885.6	2554.9	3336.2	15192.2
QUÉBEC	1067.6	331.7	685.0	5282.2	23420.1	126880.9	25172.7	132494.9
ONTARIO	13349.8	34710.4	11228.0	67552.1	7486.9	36688.7	32064.7	138951.1
MANITOBA	441.2	883.5	0.0	0.0	3641.1	15378.7	4082.3	16262.2
SASKATCHEWAN	1930.6	10273.8	0.0	0.0	835.9	2343.3	2766.4	12617.2
ALBERTA	6249.9	355003.5	0.0	0.0	733.7	1430.8	6983.6	36934.3
BRITISH COLUMBIA	1126.5	206.3	0.0	0.0	9544.2	48918.7	10670.7	49125.0
YUKON	40.9	30.3	0.0	0.0	81.7	409.0	122.6	439.3
NORTHWEST TERRITORIES	118.3	177.9	0.0	0.0	50.0	257.5	168.3	435.4
CANADA	**28686.1**	**98452.1**	**12593.0**	**78176.0**	**53632.0**	**275156.0**	**94911.0**	**451784.1**

NOTE: 1. FOR BREAKDOWN OF FOSSIL FUELLED, SEE TABLE 1.4.

TABLE 1.2

ELECTRIC UTILITIES
PROVINCIAL INSTALLED CAPACITY AND GENERATION
BY PRIMARY ENERGY SOURCE
PERCENT OF CANADIAN TOTALS
1988

PROVINCE OR TERRITORY	FOSSIL FUELLED		NUCLEAR		HYDROELECTRIC		TOTAL	
	MW	GW.h	MW	GW.h	MW	GW.h	MW	GW.h
NEWFOUNDLAND	2.6	1.5	0.0	0.0	12.3	14.3	7.7	9.0
PRINCE EDWARD ISLAND	0.4	0.1	0.0	0.0	0.0	0.0	0.1	0.0
NOVA SCOTIA	6.0	7.6	0.0	0.0	0.7	0.4	2.2	1.9
NEW BRUNSWICK	6.2	7.4	5.4	6.8	1.7	0.9	3.5	3.4
QUÉBEC	3.7	0.3	5.4	6.8	43.7	46.1	26.5	29.3
ONTARIO	46.5	35.3	89.2	86.4	14.0	13.3	33.8	30.8
MANITOBA	1.5	0.9	0.0	0.0	6.8	5.6	4.3	3.6
SASKATCHEWAN	6.7	10.4	0.0	0.0	1.6	0.9	2.9	2.8
ALBERTA	21.8	36.1	0.0	0.0	1.4	0.5	7.4	8.2
BRITISH COLUMBIA	3.9	0.2	0.0	0.0	17.8	17.8	11.2	10.9
YUKON	0.1	0.0	0.0	0.0	0.2	0.1	0.1	0.1
NORTHWEST TERRITORIES	0.4	0.2	0.0	0.0	0.1	0.1	0.2	0.1
CANADA	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

NOTE: 1. FOR BREAKDOWN OF FOSSIL FUELLED, SEE TABLE 1.5.

TABLE 1.3

ELECTRIC UTILITIES
PROVINCIAL INSTALLED CAPACITY AND GENERATION
BY PRIMARY ENERGY SOURCE
PERCENT OF PROVINCIAL TOTALS
1988

PROVINCE OR TERRITORY	FOSSIL FUELLED		NUCLEAR		HYDROELECTRIC		TOTAL	
	MW	GW.h	MW	GW.h	MW	GW.h	MW	GW.h
NEWFOUNDLAND	10.2	3.7	0.0	0.0	89.8	96.3	100.0	100.0
PRINCE EDWARD ISLAND	100.0	100.0	0.0	0.0	0.0	0.0	100.0	100.0
NOVA SCOTIA	81.9	87.4	0.0	0.0	18.1	12.6	100.0	100.0
NEW BRUNSWICK	53.1	48.0	20.4	35.2	26.5	16.8	100.0	100.0
QUÉBEC	4.2	0.3	2.7	4.0	93.0	95.8	100.0	100.0
ONTARIO	41.6	25.0	35.0	48.6	23.3	26.4	100.0	100.0
MANITOBA	10.8	5.4	0.0	0.0	89.2	94.6	100.0	100.0
SASKATCHEWAN	69.8	81.4	0.0	0.0	30.2	18.6	100.0	100.0
ALBERTA	89.5	96.1	0.0	0.0	10.5	3.9	100.0	100.0
BRITISH COLUMBIA	10.6	0.4	0.0	0.0	89.4	99.6	100.0	100.0
YUKON	33.3	6.9	0.0	0.0	66.7	93.1	100.0	100.0
NORTHWEST TERRITORIES	70.3	40.9	0.0	0.0	29.7	59.1	100.0	100.0
CANADA	**30.2**	**21.8**	**13.3**	**17.3**	**56.5**	**60.9**	**100.0**	**100.0**

NOTE: 1. FOR BREAKDOWN OF FOSSIL FUELLED, SEE TABLE 1.6.

TABLE 1.4

ELECTRIC UTILITIES
PROVINCIAL FOSSIL CAPACITY AND GENERATION
1988

PROVINCE OR TERRITORY	GENERATION(GW.h)						CAPACITY (MW)		
	STEAM			INT	GAS	TOTAL	MULTI	NON MULTI	TOTAL
	OIL	GAS	COAL	COMB	TURBINE		FUELLED	FUELLED	
NEWFOUNDLAND	1409.5	0.0	0.0	99.9	4.2	1513.6	0.0	746.4	746.4
PRINCE EDWARD ISLAND	78.4	0.0	0.0	0.3	6.3	85.1	0.0	122.1	122.1
NOVA SCOTIA	1509.7	0.0	5903.7	0.0	27.0	7440.4	0.0	1722.3	1722.3
NEW BRUNSWICK	5605.8	0.0	1686.7	0.2	2.9	7295.6	0.0	1770.6	1770.6
QUÉBEC	109.7	0.0	0.0	220.8	1.2	331.7	0.0	1067.6	1067.6
ONTARIO	482.9	1.9	34203.9	2.1	19.6	34710.4	0.0	13349.8	13349.8
MANITOBA	1.5	1.3	861.4	19.3	0.0	883.5	0.0	441.2	441.2
SASKATCHEWAN	7.1	487.5	9697.2	6.8	75.2	10273.8	0.0	1930.6	1930.6
ALBERTA	0.0	1747.4	33108.9	53.6	593.6	35503.5	0.0	6249.9	6249.9
BRITISH COLUMBIA	0.0	71.5	0.0	135.9	-1.1	206.3	0.0	1126.5	1126.5
YUKON	0.0	0.0	0.0	30.3	0.0	30.3	0.0	40.9	40.9
NORTHWEST TERRITORIES	0.0	0.0	0.0	177.9	0.0	177.9	0.0	118.3	118.3
CANADA	**9204.7**	**2309.6**	**85461.9**	**747.0**	**729.0**	**98452.1**	**0.0**	**28686.1**	**28686.1**

TABLE 1.5

ELECTRIC UTILITIES
PROVINCIAL FOSSIL CAPACITY AND GENERATION
PERCENT OF CANADIAN TOTALS
1988

PROVINCE OR TERRITORY	GENERATION(GW.h)						CAPACITY (MW)		
	STEAM			INT COMB	GAS TURBINE	TOTAL	MULTI FUELLED	NON MULTI FUELLED	TOTAL
	OIL	GAS	COAL						
NEWFOUNDLAND	15.3	0.0	0.0	13.4	0.6	1.5	0.0	2.6	2.6
PRINCE EDWARD ISLAND	0.9	0.0	0.0	0.0	0.9	0.1	0.0	0.4	0.4
NOVA SCOTIA	16.4	0.0	6.9	0.0	3.7	7.6	0.0	6.0	6.0
NEW BRUNSWICK	60.9	0.0	2.0	0.0	0.4	7.4	0.0	6.2	6.2
QUÉBEC	1.2	0.0	0.0	29.6	0.2	0.3	0.0	3.7	3.7
ONTARIO	5.2	0.1	40.0	0.3	2.7	35.3	0.0	46.5	46.5
MANITOBA	0.0	0.1	1.0	2.6	0.0	0.9	0.0	1.5	1.5
SASKATCHEWAN	0.1	21.1	11.3	0.9	10.3	10.4	0.0	6.7	6.7
ALBERTA	0.0	75.7	38.7	7.2	81.4	36.1	0.0	21.8	21.8
BRITISH COLUMBIA	0.0	3.1	0.0	18.2	-0.2	0.2	0.0	3.9	3.9
YUKON	0.0	0.0	0.0	4.1	0.0	0.0	0.0	0.1	0.1
NORTHWEST TERRITORIES	0.0	0.0	0.0	23.8	0.0	0.2	0.0	0.4	0.4
CANADA	100.0	100.0	100.0	100.0	100.0	100.0	0.0	100.0	100.0

TABLE 1.6

ELECTRIC UTILITIES
PROVINCIAL FOSSIL CAPACITY AND GENERATION
PERCENT OF PROVINCIAL TOTALS
1988

PROVINCE OR TERRITORY	GENERATION(GW.h)						CAPACITY (MW)		
	STEAM			INT	GAS	TOTAL	MULTI	NON MULTI	TOTAL
	OIL	GAS	COAL	COMB	TURBINE		FUELLED	FUELLED	
NEWFOUNDLAND	93.1	0.0	0.0	6.6	0.3	100.0	0.0	100.0	100.0
PRINCE EDWARD ISLAND	92.1	0.0	0.0	0.4	7.5	100.0	0.0	100.0	100.0
NOVA SCOTIA	20.3	0.0	79.3	0.0	0.4	100.0	0.0	100.0	100.0
NEW BRUNSWICK	76.8	0.0	23.1	0.0	0.0	100.0	0.0	100.0	100.0
QUÉBEC	33.1	0.0	0.0	66.6	0.4	100.0	0.0	100.0	100.0
ONTARIO	1.4	0.0	98.5	0.0	0.1	100.0	0.0	100.0	100.0
MANITOBA	0.2	0.1	97.5	2.2	0.0	100.0	0.0	100.0	100.0
SASKATCHEWAN	0.1	4.7	94.4	0.1	0.7	100.0	0.0	100.0	100.0
ALBERTA	0.0	4.9	93.3	0.2	1.7	100.0	0.0	100.0	100.0
BRITISH COLUMBIA	0.0	34.7	0.0	65.9	-0.5	100.0	0.0	100.0	100.0
YUKON	0.0	0.0	0.0	100.0	0.0	100.0	0.0	100.0	100.0
NORTHWEST TERRITORIES	0.0	0.0	0.0	100.0	0.0	100.0	0.0	100.0	100.0
CANADA	**9.3**	**2.3**	**86.8**	**0.8**	**0.7**	**100.0**	**0.0**	**100.0**	**100.0**

TABLE 1.7

ELECTRIC UTILITIES
PROVINCIAL GENERATION BY TYPE OF COAL AND OIL (GW.h)
1987

PROVINCE OR TERRITORY	COAL					OIL			
	BITUMINOUS CANADIAN	BITUMINOUS IMPORTED	SUBBITUMINOUS	LIGNITE	TOTAL COAL	LIGHT	HEAVY	DIESEL	TOTAL OIL
NEWFOUNDLAND	0.0	0.0	0.0	0.0	0.0	2.3	1408.5	102.8	1513.6
PRINCE EDWARD ISLAND	0.0	0.0	0.0	0.0	0.0	0.2	78.4	6.5	85.1
NOVA SCOTIA	5903.7	0.0	0.0	0.0	5903.7	13.0	1496.7	27.0	1536.7
NEW BRUNSWICK	1686.7	0.0	0.0	0.0	1686.7	12.7	5593.1	3.1	5608.9
QUÉBEC	0.0	0.0	0.0	0.0	0.0	1.2	330.5	0.0	331.7
ONTARIO	7078.7	24076.3	0.0	3048.9	34203.9	150.8	352.2	0.5	503.5
MANITOBA	0.0	0.0	0.0	861.4	861.4	1.5	0.0	19.3	20.8
SASKATCHEWAN	0.0	0.0	0.0	9697.2	9697.2	7.1	0.0	6.8	13.9
ALBERTA	659.3	0.0	32449.6	0.0	33108.9	0.0	0.0	12.9	12.9
BRITISH COLUMBIA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	77.2	77.2
YUKON	0.0	0.0	0.0	0.0	0.0	0.0	0.0	30.3	30.3
NORTHWEST TERRITORIES	0.0	0.0	0.0	0.0	0.0	0.0	15.5	162.4	177.9
CANADA	**15328.5**	**24076.3**	**32449.6**	**13607.5**	**85461.9**	**188.8**	**9274.9**	**448.7**	**9912.4**

TABLE 1.8

ELECTRIC UTILITIES
GENERATION DATA FOR CANADA
1988

FUEL	QUANTITY CONSUMED (1)	AVERAGE HEAT CONTENT (2)	COST $('000)	% TOTAL FUEL COST	GENERATION GW.h	% TOTAL GENERATION	COST/UNIT QUANTITY (3)	COST $/GJ	MILLS/ kW.h
COAL									
-BITUMINOUS	14639.5	27783.6	903458.2	45.6	39404.7	8.7	61.7	2.2	22.9
-SUBBITUMINOUS	19859.1	18362.4	147608.3	7.4	32449.6	7.2	7.4	0.4	4.6
-LIGNITE	11481.8	14868.8	178438.7	9.0	13607.5	3.0	15.5	1.1	13.1
-TOTAL	45980.3	20489.6	1229505.1	62.0	85461.9	18.9	26.7	1.3	14.4
OIL									
-LIGHT	63039.0	38166.5	12590.7	0.6	188.8	0.0	199.7	5.2	66.7
-HEAVY	2390936.0	41488.0	230782.4	11.6	9274.9	2.1	96.5	2.3	24.9
-DIESEL	161081.0	37675.0	49439.3	2.5	448.7	0.1	306.9	8.2	110.2
-TOTAL	2615056.0	41173.1	292812.4	14.8	9912.4	2.2	112.0	2.7	29.5
NATURAL GAS	1053.0	38384.1	81984.9	4.1	3077.9	0.7	77.9	2.0	26.6
URANIUM	1357673.0	692422.9	379022.5	19.1	78176.0	17.3	279.2	0.4	4.9
HYDROELECTRIC					275156.1	60.9			
TOTAL			1983324.9	100.0	451784.3	100.0			4.4

NOTE: (1) QUANTITY CONSUMED IS MEASURED IN THOUSANDS OF TONNES (COAL), KILOLITRES (OIL), MILLIONS OF CUBIC METRES(GAS), AND KILOGRAMS (CONTAINED URANIUM).

(2) AVERAGE HEAT CONTENT IS MEASURED IN KILOJOULES PER KILOGRAM (COAL), KILOJOULES PER LITRE (OIL), KILOJOULES PER CUBIC METRE (GAS), AND KILOJOULES PER GRAM (CONTAINED URANIUM).

(3) UNIT QUANTITY IS MEASURED IN TONNES (COAL), KILOLITRES (OIL), THOUSANDS OF CUBIC METRES (GAS), AND KILOGRAMS (CONTAINED URANIUM).

TABLE 2.1

ELECTRIC UTILITIES
GENERATION DATA FOR NEWFOUNDLAND
1988

FUEL	QUANTITY CONSUMED (1)	AVERAGE HEAT CONTENT (2)	COST $('000)	% TOTAL FUEL COST	GENERATION GW.h	% TOTAL GENERATION	COST/UNIT QUANTITY (3)	COST $/GJ	MILLS/ kW.h
COAL									
-BITUMINOUS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
-SUBBITUMINOUS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
-LIGNITE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
-TOTAL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
OIL									
-LIGHT	1842.0	38489.0	420.8	1.0	2.3	0.0	228.5	5.9	182.8
-HEAVY	366071.0	41807.0	32593.6	79.1	1408.5	3.5	89.0	2.1	23.1
-DIESEL	32881.0	38347.3	8206.1	19.9	102.8	0.3	249.6	6.5	79.8
-TOTAL	400794.0	41507.9	41220.5	100.0	1513.6	3.7	102.8	2.5	27.2
NATURAL GAS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
URANIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
HYDROELECTRIC					39222.3	96.3			
TOTAL			41220.5	100.0	40735.9	100.0			1.0

NOTE: (1) QUANTITY CONSUMED IS MEASURED IN THOUSANDS OF TONNES (COAL), KILOLITRES (OIL), MILLIONS OF CUBIC METRES(GAS), AND KILOGRAMS (CONTAINED URANIUM).

(2) AVERAGE HEAT CONTENT IS MEASURED IN KILOJOULES PER KILOGRAM (COAL), KILOJOULES PER LITRE (OIL), KILOJOULES PER CUBIC METRE (GAS), AND KILOJOULES PER GRAM (CONTAINED URANIUM).

(3) UNIT QUANTITY IS MEASURED IN TONNES (COAL), KILOLITRES (OIL), THOUSANDS OF CUBIC METRES (GAS), AND KILOGRAMS (CONTAINED URANIUM).

TABLE 2.2

ELECTRIC UTILITIES
GENERATION DATA FOR PRINCE EDWARD ISLAND
1988

FUEL	QUANTITY CONSUMED (1)	AVERAGE HEAT CONTENT (2)	COST $('000)	% TOTAL FUEL COST	GENERATION GW.h	% TOTAL GENERATION	COST/UNIT QUANTITY (3)	COST $/GJ	MILLS/ kW.h
COAL									
-BITUMINOUS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
-SUBBITUMINOUS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
-LIGNITE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
-TOTAL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
OIL									
-LIGHT	57.0	38680.0	10.7	0.2	0.2	0.2	186.9	4.8	54.1
-HEAVY	35429.0	41436.0	4289.2	87.0	78.4	92.1	121.1	2.9	54.7
-DIESEL	3183.0	35487.4	631.4	12.8	6.5	7.6	198.4	5.6	97.4
-TOTAL	38669.0	40942.3	4931.3	100.0	85.1	100.0	127.5	3.1	58.0
NATURAL GAS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
URANIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
HYDROELECTRIC					0.0	0.0			
TOTAL			4931.3	100.0	85.1	100.0			58.0

NOTE: (1) QUANTITY CONSUMED IS MEASURED IN THOUSANDS OF TONNES (COAL), KILOLITRES (OIL), MILLIONS OF CUBIC METRES(GAS), AND KILOGRAMS (CONTAINED URANIUM).

(2) AVERAGE HEAT CONTENT IS MEASURED IN KILOJOULES PER KILOGRAM (COAL), KILOJOULES PER LITRE (OIL), KILOJOULES PER CUBIC METRE (GAS), AND KILOJOULES PER GRAM (CONTAINED URANIUM).

(3) UNIT QUANTITY IS MEASURED IN TONNES (COAL), KILOLITRES (OIL), THOUSANDS OF CUBIC METRES (GAS), AND KILOGRAMS (CONTAINED URANIUM).

TABLE 2.3

ELECTRIC UTILITIES
GENERATION DATA FOR NOVA SCOTIA
1988

FUEL	QUANTITY CONSUMED (1)	AVERAGE HEAT CONTENT (2)	COST $('000)	% TOTAL FUEL COST	GENERATION GW.h	% TOTAL GENERATION	COST/UNIT QUANTITY (3)	COST $/GJ	MILLS/ kW.h
COAL									
-BITUMINOUS	2265.7	27485.6	169868.6	81.3	5903.7	69.4	75.0	2.7	28.8
-SUBBITUMINOUS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
-LIGNITE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
-TOTAL	2265.7	27485.6	169868.6	81.3	5903.7	69.4	75.0	2.7	28.8
OIL									
-LIGHT	3845.0	37578.9	804.8	0.4	13.0	0.2	209.3	5.6	62.1
-HEAVY	384843.0	41863.6	36383.6	17.4	1496.7	17.6	94.5	2.3	24.3
-DIESEL	9805.0	37582.1	1928.9	0.9	27.0	0.3	196.7	5.2	71.5
-TOTAL	398493.0	41716.9	39117.4	18.7	1536.7	18.1	98.2	2.4	25.5
NATURAL GAS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
URANIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
HYDROELECTRIC					1071.3	12.6			
TOTAL			208986.0	100.0	8511.7	100.0			24.6

NOTE: (1) QUANTITY CONSUMED IS MEASURED IN THOUSANDS OF TONNES (COAL), KILOLITRES (OIL), MILLIONS OF CUBIC METRES(GAS), AND KILOGRAMS (CONTAINED URANIUM).

(2) AVERAGE HEAT CONTENT IS MEASURED IN KILOJOULES PER KILOGRAM (COAL), KILOJOULES PER LITRE (OIL), KILOJOULES PER CUBIC METRE (GAS), AND KILOJOULES PER GRAM (CONTAINED URANIUM).

(3) UNIT QUANTITY IS MEASURED IN TONNES (COAL), KILOLITRES (OIL), THOUSANDS OF CUBIC METRES (GAS), AND KILOGRAMS (CONTAINED URANIUM).

TABLE 2.4

ELECTRIC UTILITIES
GENERATION DATA FOR NEW BRUNSWICK
1988

FUEL	QUANTITY CONSUMED (1)	AVERAGE HEAT CONTENT (2)	COST $('000)	% TOTAL FUEL COST	GENERATION GW.h	% TOTAL GENERATION	COST/UNIT QUANTITY (3)	COST $/GJ	MILLS/ kW.h
COAL									
-BITUMINOUS	678.0	26901.0	45902.2	25.2	1686.7	11.1	67.7	2.5	27.2
-SUBBITUMINOUS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
-LIGNITE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
-TOTAL	678.0	26901.0	45902.2	25.2	1686.7	11.1	67.7	2.5	27.2
OIL									
-LIGHT	3550.0	38741.0	700.3	0.4	12.7	0.1	197.3	5.1	55.2
-HEAVY	1368608.0	41409.0	120287.2	66.0	5593.1	36.8	87.9	2.1	21.5
-DIESEL	2557.0	39140.8	478.8	0.3	3.1	0.0	187.3	4.8	155.8
-TOTAL	1374715.0	41397.9	121466.3	66.6	5608.9	36.9	88.4	2.1	21.7
NATURAL GAS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
URANIUM	101931.0	576200.0	14894.3	8.2	5341.7	35.2	146.1	0.3	2.8
HYDROELECTRIC					2554.9	16.8			
TOTAL			182262.7	100.0	15192.2	100.0			12.0

NOTE: (1) QUANTITY CONSUMED IS MEASURED IN THOUSANDS OF TONNES (COAL), KILOLITRES (OIL), MILLIONS OF CUBIC METRES(GAS), AND KILOGRAMS (CONTAINED URANIUM).

(2) AVERAGE HEAT CONTENT IS MEASURED IN KILOJOULES PER KILOGRAM (COAL), KILOJOULES PER LITRE (OIL), KILOJOULES PER CUBIC METRE (GAS), AND KILOJOULES PER GRAM (CONTAINED URANIUM).

(3) UNIT QUANTITY IS MEASURED IN TONNES (COAL), KILOLITRES (OIL), THOUSANDS OF CUBIC METRES (GAS), AND KILOGRAMS (CONTAINED URANIUM).

TABLE 2.5

ELECTRIC UTILITIES
GENERATION DATA FOR QUÉBEC
1988

FUEL	QUANTITY CONSUMED (1)	AVERAGE HEAT CONTENT (2)	COST $('000)	% TOTAL FUEL COST	GENERATION GW.h	% TOTAL GENERATION	COST/UNIT QUANTITY (3)	COST $/GJ	MILLS/ kW.h
COAL									
-BITUMINOUS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
-SUBBITUMINOUS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
-LIGNITE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
-TOTAL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
OIL									
-LIGHT	4074.0	37500.0	1115.4	4.0	1.2	0.0	273.8	7.3	895.2
-HEAVY	119412.0	40049.7	14706.0	53.1	330.5	0.2	123.2	3.1	44.5
-DIESEL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
-TOTAL	123486.0	39965.6	15821.4	57.1	331.7	0.3	128.1	3.2	47.7
NATURAL GAS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
URANIUM	95282.0	680000.0	11894.1	42.9	5282.2	4.0	124.8	0.2	2.3
HYDROELECTRIC					126880.9	95.8			
TOTAL			27715.5	100.0	132494.9	100.0			0.2

NOTE: (1) QUANTITY CONSUMED IS MEASURED IN THOUSANDS OF TONNES (COAL), KILOLITRES (OIL), MILLIONS OF CUBIC METRES(GAS), AND KILOGRAMS (CONTAINED URANIUM).

(2) AVERAGE HEAT CONTENT IS MEASURED IN KILOJOULES PER KILOGRAM (COAL), KILOJOULES PER LITRE (OIL), KILOJOULES PER CUBIC METRE (GAS), AND KILOJOULES PER GRAM (CONTAINED URANIUM).

(3) UNIT QUANTITY IS MEASURED IN TONNES (COAL), KILOLITRES (OIL), THOUSANDS OF CUBIC METRES (GAS), AND KILOGRAMS (CONTAINED URANIUM).

TABLE 2.6

ELECTRIC UTILITIES
GENERATION DATA FOR ONTARIO
1988

FUEL	QUANTITY CONSUMED (1)	AVERAGE HEAT CONTENT (2)	COST $('000)	% TOTAL FUEL COST	GENERATION GW.h	% TOTAL GENERATION	COST/UNIT QUANTITY (3)	COST $/GJ	MILLS/ kW.h
COAL									
-BITUMINOUS	11006.3	28687.0	683936.9	60.1	31155.0	22.4	62.1	2.2	2[illegible].0
-SUBBITUMINOUS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
-LIGNITE	2071.8	16138.9	71416.5	6.3	3048.9	2.2	34.5	2.1	23.4
-TOTAL	13078.1	26699.1	755353.4	66.4	34203.9	24.6	57.8	2.2	22.1
OIL									
-LIGHT	46756.0	38248.2	8906.3	0.8	150.8	0.1	190.5	5.0	59.1
-HEAVY	111000.0	41600.0	20937.6	1.8	352.2	0.3	188.6	4.5	59.5
-DIESEL	183.0	37705.0	48.7	0.0	0.5	0.0	265.9	7.1	97.1
-TOTAL	157939.0	40603.2	29892.6	2.6	503.5	0.4	189.3	4.7	59.4
NATURAL GAS	0.9	37395.1	160.6	0.0	3.0	0.0	177.6	4.8	53.8
URANIUM	1160460.0	703651.5	352234.1	31.0	67552.1	48.6	303.5	0.4	5.2
HYDROELECTRIC					36688.7	26.4			
TOTAL			1137640.7	100.0	138951.2	100.0			8.2

NOTE: (1) QUANTITY CONSUMED IS MEASURED IN THOUSANDS OF TONNES (COAL), KILOLITRES (OIL), MILLIONS OF CUBIC METRES(GAS), AND KILOGRAMS (CONTAINED URANIUM).

(2) AVERAGE HEAT CONTENT IS MEASURED IN KILOJOULES PER KILOGRAM (COAL), KILOJOULES PER LITRE (OIL), KILOJOULES PER CUBIC METRE (GAS), AND KILOJOULES PER GRAM (CONTAINED URANIUM).

(3) UNIT QUANTITY IS MEASURED IN TONNES (COAL), KILOLITRES (OIL), THOUSANDS OF CUBIC METRES (GAS), AND KILOGRAMS (CONTAINED URANIUM).

TABLE 2.7

ELECTRIC UTILITIES
GENERATION DATA FOR MANITOBA
1988

FUEL	QUANTITY CONSUMED (1)	AVERAGE HEAT CONTENT (2)	COST $('000)	% TOTAL FUEL COST	GENERATION GW.h	% TOTAL GENERATION	COST/UNIT QUANTITY (3)	COST $/GJ	MILLS/ kW.h
COAL									
-BITUMINOUS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
-SUBBITUMINOUS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
-LIGNITE	773.2	16033.4	20118.8	90.9	861.4	5.3	26.0	1.6	23.4
-TOTAL	773.2	16033.4	20118.8	90.9	861.4	5.3	26.0	1.6	23.4
OIL									
-LIGHT	539.0	37981.1	119.6	0.5	1.5	0.0	221.8	5.8	80.5
-HEAVY	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
-DIESEL	6751.0	38290.9	1836.6	8.3	19.3	0.1	272.0	7.1	95.3
-TOTAL	7290.0	38268.0	1956.1	8.8	20.8	0.1	268.3	7.0	94.3
NATURAL GAS	0.5	37223.0	68.1	0.3	1.3	0.0	127.7	3.4	51.9
URANIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
HYDROELECTRIC					15378.7	94.6			
TOTAL			22143.0	100.0	16262.2	100.0			1.4

NOTE: (1) QUANTITY CONSUMED IS MEASURED IN THOUSANDS OF TONNES (COAL), KILOLITRES (OIL), MILLIONS OF CUBIC METRES(GAS), AND KILOGRAMS (CONTAINED URANIUM).

(2) AVERAGE HEAT CONTENT IS MEASURED IN KILOJOULES PER KILOGRAM (COAL), KILOJOULES PER LITRE (OIL), KILOJOULES PER CUBIC METRE (GAS), AND KILOJOULES PER GRAM (CONTAINED URANIUM).

(3) UNIT QUANTITY IS MEASURED IN TONNES (COAL), KILOLITRES (OIL), THOUSANDS OF CUBIC METRES (GAS), AND KILOGRAMS (CONTAINED URANIUM).

TABLE 2.8

ELECTRIC UTILITIES
GENERATION DATA FOR SASKATCHEWAN
1988

FUEL	QUANTITY CONSUMED (1)	AVERAGE HEAT CONTENT (2)	COST $('000)	% TOTAL FUEL COST	GENERATION GW.h	% TOTAL GENERATION	COST/UNIT QUANTITY (3)	COST $/GJ	MILLS/ kW.h
COAL									
-BITUMINOUS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
-SUBBITUMINOUS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
-LIGNITE	8636.7	14459.8	86903.3	81.8	9697.2	76.9	10.1	0.7	9.0
-TOTAL	8636.7	14459.8	86903.3	81.8	9697.2	76.9	10.1	0.7	9.0
OIL									
-LIGHT	2376.0	37574.9	512.8	0.5	7.1	0.1	215.8	5.7	71.8
-HEAVY	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
-DIESEL	2456.0	38000.0	808.8	0.8	6.8	0.1	329.3	8.7	119.5
-TOTAL	4832.0	37791.0	1321.7	1.2	13.9	0.1	273.5	7.2	95.0
NATURAL GAS	212.0	38033.8	18037.1	17.0	562.8	4.5	85.1	2.2	32.1
URANIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
HYDROELECTRIC					2343.3	18.6			
TOTAL			106262.1	100.0	12617.1	100.0			8.4

NOTE: (1) QUANTITY CONSUMED IS MEASURED IN THOUSANDS OF TONNES (COAL), KILOLITRES (OIL), MILLIONS OF CUBIC METRES(GAS), AND KILOGRAMS (CONTAINED URANIUM).

(2) AVERAGE HEAT CONTENT IS MEASURED IN KILOJOULES PER KILOGRAM (COAL), KILOJOULES PER LITRE (OIL), KILOJOULES PER CUBIC METRE (GAS), AND KILOJOULES PER GRAM (CONTAINED URANIUM).

(3) UNIT QUANTITY IS MEASURED IN TONNES (COAL), KILOLITRES (OIL), THOUSANDS OF CUBIC METRES (GAS), AND KILOGRAMS (CONTAINED URANIUM).

TABLE 2.9

ELECTRIC UTILITIES
GENERATION DATA FOR ALBERTA
1988

FUEL	QUANTITY CONSUMED (1)	AVERAGE HEAT CONTENT (2)	COST $('000)	% TOTAL FUEL COST	GENERATION GW.h	% TOTAL GENERATION	COST/UNIT QUANTITY (3)	COST $/GJ	MILLS/ kW.h
COAL									
-BITUMINOUS	689.5	15210.0	3750.5	1.9	659.3	1.8	5.4	0.4	5.7
-SUBBITUMINOUS	19859.1	18362.4	147608.3	73.9	32449.6	87.9	7.4	0.4	4.6
-LIGNITE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
-TOTAL	20548.6	18256.6	151358.8	75.7	33108.9	89.6	7.4	0.4	4.6
OIL									
-LIGHT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
-HEAVY	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
-DIESEL	4369.0	37880.0	1068.3	0.5	12.9	0.0	244.5	6.5	83.0
-TOTAL	4369.0	37880.0	1068.3	0.5	12.9	0.0	244.5	6.5	83.0
NATURAL GAS	798.0	38532.8	47392.8	23.7	2381.7	6.4	59.4	1.5	19.9
URANIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
HYDROELECTRIC					1430.8	3.9			
TOTAL			199819.9	100.0	36934.3	100.0			5.4

NOTE: (1) QUANTITY CONSUMED IS MEASURED IN THOUSANDS OF TONNES (COAL), KILOLITRES (OIL), MILLIONS OF CUBIC METRES(GAS), AND KILOGRAMS (CONTAINED URANIUM).

(2) AVERAGE HEAT CONTENT IS MEASURED IN KILOJOULES PER KILOGRAM (COAL), KILOJOULES PER LITRE (OIL), KILOJOULES PER CUBIC METRE (GAS), AND KILOJOULES PER GRAM (CONTAINED URANIUM).

(3) UNIT QUANTITY IS MEASURED IN TONNES (COAL), KILOLITRES (OIL), THOUSANDS OF CUBIC METRES (GAS), AND KILOGRAMS (CONTAINED URANIUM).

TABLE 2.10

ELECTRIC UTILITIES
GENERATION DATA FOR BRITISH COLUMBIA
1988

FUEL	QUANTITY CONSUMED (1)	AVERAGE HEAT CONTENT (2)	COST $('000)	% TOTAL FUEL COST	GENERATION GW.h	% TOTAL GENERATION	COST/UNIT QUANTITY (3)	COST $/GJ	MILLS/ kW.h
COAL									
-BITUMINOUS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
-SUBBITUMINOUS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
-LIGNITE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
-TOTAL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
OIL									
-LIGHT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
-HEAVY	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
-DIESEL	25781.0	36168.8	8647.4	34.6	77.2	0.2	335.4	9.3	112.0
-TOTAL	25781.0	36168.8	8647.4	34.6	77.2	0.2	335.4	9.3	112.0
NATURAL GAS	41.6	37352.0	16326.4	65.4	129.1	0.3	392.3	10.5	126.5
URANIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
HYDROELECTRIC					48918.7	99.6			
TOTAL			24973.8	100.0	49125.0	100.0			0.5

NOTE: (1) QUANTITY CONSUMED IS MEASURED IN THOUSANDS OF TONNES (COAL), KILOLITRES (OIL), MILLIONS OF CUBIC METRES(GAS), AND KILOGRAMS (CONTAINED URANIUM).

(2) AVERAGE HEAT CONTENT IS MEASURED IN KILOJOULES PER KILOGRAM (COAL), KILOJOULES PER LITRE (OIL), KILOJOULES PER CUBIC METRE (GAS), AND KILOJOULES PER GRAM (CONTAINED URANIUM).

(3) UNIT QUANTITY IS MEASURED IN TONNES (COAL), KILOLITRES (OIL), THOUSANDS OF CUBIC METRES (GAS), AND KILOGRAMS (CONTAINED URANIUM).

TABLE 2.11

ELECTRIC UTILITIES
GENERATION DATA FOR YUKON
1988

FUEL	QUANTITY CONSUMED (1)	AVERAGE HEAT CONTENT (2)	COST $('000)	% TOTAL FUEL COST	GENERATION GW.h	% TOTAL GENERATION	COST/UNIT QUANTITY (3)	COST $/GJ	MILLS/ kW.h
COAL									
-BITUMINOUS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
-SUBBITUMINOUS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
-LIGNITE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
-TOTAL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
OIL									
-LIGHT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
-HEAVY	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
-DIESEL	8353.0	37880.0	2382.9	100.0	30.3	6.9	285.3	7.5	78.7
-TOTAL	8353.0	37880.0	2382.9	100.0	30.3	6.9	285.3	7.5	78.7
NATURAL GAS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
URANIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
HYDROELECTRIC					409.0	93.1			
TOTAL			2382.9	100.0	439.3	100.0			5.4

NOTE: (1) QUANTITY CONSUMED IS MEASURED IN THOUSANDS OF TONNES (COAL), KILOLITRES (OIL), MILLIONS OF CUBIC METRES(GAS), AND KILOGRAMS (CONTAINED URANIUM).

(2) AVERAGE HEAT CONTENT IS MEASURED IN KILOJOULES PER KILOGRAM (COAL), KILOJOULES PER LITRE (OIL), KILOJOULES PER CUBIC METRE (GAS), AND KILOJOULES PER GRAM (CONTAINED URANIUM).

(3) UNIT QUANTITY IS MEASURED IN TONNES (COAL), KILOLITRES (OIL), THOUSANDS OF CUBIC METRES (GAS), AND KILOGRAMS (CONTAINED URANIUM).

TABLE 2.12

ELECTRIC UTILITIES
GENERATION DATA FOR NORTHWEST TERRITORIES
1988

FUEL	QUANTITY CONSUMED (1)	AVERAGE HEAT CONTENT (2)	COST $('000)	% TOTAL FUEL COST	GENERATION GW.h	% TOTAL GENERATION	COST/UNIT QUANTITY (3)	COST $/GJ	MILLS/ kW.h
COAL									
-BITUMINOUS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
-SUBBITUMINOUS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
-LIGNITE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
-TOTAL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
OIL									
-LIGHT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
-HEAVY	5573.0	42924.0	1585.2	6.3	15.5	3.6	284.4	6.6	102.3
-DIESEL	64762.0	37880.0	23401.3	93.7	162.4	37.3	361.3	9.5	144.1
-TOTAL	70335.0	38279.7	24986.5	100.0	177.9	40.9	355.3	9.3	140.5
NATURAL GAS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
URANIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
HYDROELECTRIC					257.5	59.1			
TOTAL			24986.5	100.0	435.4	100.0			57.4

NOTE: (1) QUANTITY CONSUMED IS MEASURED IN THOUSANDS OF TONNES (COAL), KILOLITRES (OIL), MILLIONS OF CUBIC METRES(GAS), AND KILOGRAMS (CONTAINED URANIUM).

(2) AVERAGE HEAT CONTENT IS MEASURED IN KILOJOULES PER KILOGRAM (COAL), KILOJOULES PER LITRE (OIL), KILOJOULES PER CUBIC METRE (GAS), AND KILOJOULES PER GRAM (CONTAINED URANIUM).

(3) UNIT QUANTITY IS MEASURED IN TONNES (COAL), KILOLITRES (OIL), THOUSANDS OF CUBIC METRES (GAS), AND KILOGRAMS (CONTAINED URANIUM).

TABLE 3.1

ELECTRIC UTILITIES
PROVINCIAL CONSUMPTION AND COST
BITUMINOUS COAL
1988

PROVINCE OR TERRITORY	QUANTITY TONNES	HEAT CONTENT kJ/kg	COST '000 $	GENERATION GW.h	COST $/TONNE	COST $/GJ	COST MILLS/kW.h
NEWFOUNDLAND	0.0	0.0	0.0	0.0	0.000	0.000	0.00
PRINCE EDWARD ISLAND	0.0	0.0	0.0	0.0	0.000	0.000	0.00
NOVA SCOTIA	2265673.0	27485.6	169868.6	5903.7	74.975	2.728	28.77
NEW BRUNSWICK	677965.0	26901.0	45902.2	1686.7	67.706	2.517	27.21
QUÉBEC	0.0	0.0	0.0	0.0	0.000	0.000	0.00
ONTARIO	11006293.0	28687.0	683936.9	31155.0	62.141	2.166	21.95
MANITOBA	0.0	0.0	0.0	0.0	0.000	0.000	0.00
SASKATCHEWAN	0.0	0.0	0.0	0.0	0.000	0.000	0.00
ALBERTA	689531.0	15210.0	3750.5	659.3	5.439	0.358	5.69
BRITISH COLUMBIA	0.0	0.0	0.0	0.0	0.000	0.000	0.00
YUKON	0.0	0.0	0.0	0.0	0.000	0.000	0.00
NORTHWEST TERRITORIES	0.0	0.0	0.0	0.0	0.000	0.000	0.00
CANADA	**14639462.0**	**27783.6**	**903458.2**	**39404.7**	**61.714**	**2.221**	**22.93**

TABLE 3.2

ELECTRIC UTILITIES
PROVINCIAL CONSUMPTION AND COST
SUBBITUMINOUS COAL
1988

PROVINCE OR TERRITORY	QUANTITY TONNES	HEAT CONTENT kJ/kg	COST '000 $	GENERATION GW.h	COST $/TONNE	COST $/GJ	COST MILLS/kW.h
NEWFOUNDLAND	0.0	0.0	0.0	0.0	0.000	0.000	0.00
PRINCE EDWARD ISLAND	0.0	0.0	0.0	0.0	0.000	0.000	0.00
NOVA SCOTIA	0.0	0.0	0.0	0.0	0.000	0.000	0.00
NEW BRUNSWICK	0.0	0.0	0.0	0.0	0.000	0.000	0.00
QUÉBEC	0.0	0.0	0.0	0.0	0.000	0.000	0.00
ONTARIO	0.0	0.0	0.0	0.0	0.000	0.000	0.00
MANITOBA	0.0	0.0	0.0	0.0	0.000	0.000	0.00
SASKATCHEWAN	0.0	0.0	0.0	0.0	0.000	0.000	0.00
ALBERTA	19859055.0	18362.4	147608.3	32449.6	7.433	0.405	4.55
BRITISH COLUMBIA	0.0	0.0	0.0	0.0	0.000	0.000	0.00
YUKON	0.0	0.0	0.0	0.0	0.000	0.000	0.00
NORTHWEST TERRITORIES	0.0	0.0	0.0	0.0	0.000	0.000	0.00
CANADA	**19859055.0**	**18362.4**	**147608.3**	**32449.6**	**7.433**	**0.405**	**4.55**

TABLE 3.3

ELECTRIC UTILITIES
PROVINCIAL CONSUMPTION AND COST
LIGNITE
1988

PROVINCE OR TERRITORY	QUANTITY TONNES	HEAT CONTENT kJ/kg	COST '000 $	GENERATION GW.h	COST $/TONNE	COST $/GJ	COST MILLS/kW.h
NEWFOUNDLAND	0.0	0.0	0.0	0.0	0.000	0.000	0.00
PRINCE EDWARD ISLAND	0.0	0.0	0.0	0.0	0.000	0.000	0.00
NOVA SCOTIA	0.0	0.0	0.0	0.0	0.000	0.000	0.00
NEW BRUNSWICK	0.0	0.0	0.0	0.0	0.000	0.000	0.00
QUÉBEC	0.0	0.0	0.0	0.0	0.000	0.000	0.00
ONTARIO	2071847.0	16138.9	71416.5	3048.9	34.470	2.136	23.42
MANITOBA	773215.0	16033.4	20118.8	861.4	26.020	1.623	23.36
SASKATCHEWAN	8636720.0	14459.8	86903.3	9697.2	10.062	0.696	8.96
ALBERTA	0.0	0.0	0.0	0.0	0.000	0.000	0.00
BRITISH COLUMBIA	0.0	0.0	0.0	0.0	0.000	0.000	0.00
YUKON	0.0	0.0	0.0	0.0	0.000	0.000	0.00
NORTHWEST TERRITORIES	0.0	0.0	0.0	0.0	0.000	0.000	0.00
CANADA	**11481782.0**	**14868.8**	**178438.7**	**13607.5**	**15.541**	**1.045**	**13.11**

TABLE 3.4

ELECTRIC UTILITIES
PROVINCIAL CONSUMPTION AND COST
LIGHT OIL
1988

PROVINCE OR TERRITORY	QUANTITY KILOLITRES	HEAT CONTENT kJ/L	COST '000 $	GENERATION GW.h	COST $/kL	COST $/GJ	COST MILLS/kW.h
NEWFOUNDLAND	1842.0	38489.0	420.8	2.3	228.451	5.935	182.80
PRINCE EDWARD ISLAND	57.0	38680.0	10.7	0.2	186.912	4.832	54.08
NOVA SCOTIA	3845.0	37578.9	804.8	13.0	209.310	5.570	62.11
NEW BRUNSWICK	3550.0	38741.0	700.3	12.7	197.255	5.092	55.16
QUÉBEC	4074.0	37500.0	1115.4	1.2	273.795	7.301	895.22
ONTARIO	46756.0	38248.2	8906.3	150.8	190.484	4.980	59.07
MANITOBA	539.0	37981.1	119.6	1.5	221.826	5.840	80.51
SASKATCHEWAN	2376.0	37574.9	512.8	7.1	215.845	5.744	71.77
ALBERTA	0.0	0.0	0.0	0.0	0.000	0.000	0.00
BRITISH COLUMBIA	0.0	0.0	0.0	0.0	0.000	0.000	0.00
YUKON	0.0	0.0	0.0	0.0	0.000	0.000	0.00
NORTHWEST TERRITORIES	0.0	0.0	0.0	0.0	0.000	0.000	0.00
CANADA	**63039.0**	**38166.5**	**12590.7**	**188.8**	**199.728**	**5.233**	**66.68**

TABLE 3.5

ELECTRIC UTILITIES
PROVINCIAL CONSUMPTION AND COST
HEAVY OIL
1988

PROVINCE OR TERRITORY	QUANTITY KILOLITRES	HEAT CONTENT kJ/L	COST '000 $	GENERATION GW.h	COST $/kL	COST $/GJ	COST MILLS/kW.h
NEWFOUNDLAND	366071.0	41807.0	32593.6	1408.5	89.036	2.130	23.14
PRINCE EDWARD ISLAND	35429.0	41436.0	4289.2	78.4	121.065	2.922	54.72
NOVA SCOTIA	384843.0	41863.6	36383.6	1496.7	94.541	2.258	24.31
NEW BRUNSWICK	1368608.0	41409.0	120287.2	5593.1	87.890	2.122	21.51
QUÉBEC	119412.0	40049.7	14706.0	330.5	123.153	3.075	44.50
ONTARIO	111000.0	41600.0	20937.6	352.2	188.627	4.534	59.45
MANITOBA	0.0	0.0	0.0	0.0	0.000	0.000	0.00
SASKATCHEWAN	0.0	0.0	0.0	0.0	0.000	0.000	0.00
ALBERTA	0.0	0.0	0.0	0.0	0.000	0.000	0.00
BRITISH COLUMBIA	0.0	0.0	0.0	0.0	0.000	0.000	0.00
YUKON	0.0	0.0	0.0	0.0	0.000	0.000	0.00
NORTHWEST TERRITORIES	5573.0	42924.0	1585.2	15.5	284.444	6.627	102.28
CANADA	**2390936.0**	**41488.0**	**230782.4**	**9274.9**	**96.524**	**2.327**	**24.88**

TABLE 3.6

ELECTRIC UTILITIES
PROVINCIAL CONSUMPTION AND COST
DIESEL OIL
1988

PROVINCE OR TERRITORY	QUANTITY KILOLITRE	HEAT CONTENT kJ/L	COST '000 $	GENERATION GW.h	COST $/kL	COST $/GJ	COST MILLS/kW.h
NEWFOUNDLAND	32881.0	38347.3	8206.1	102.8	249.569	6.508	79.80
PRINCE EDWARD ISLAND	3183.0	35487.4	631.4	6.5	198.370	5.590	97.40
NOVA SCOTIA	9805.0	37582.1	1928.9	27.0	196.731	5.235	71.53
NEW BRUNSWICK	2557.0	39140.8	478.8	3.1	187.262	4.784	155.82
QUÉBEC	0.0	0.0	0.0	0.0	0.000	0.000	0.00
ONTARIO	183.0	37705.0	48.7	0.5	265.918	7.053	97.13
MANITOBA	6751.0	38290.9	1836.6	19.3	272.045	7.105	95.32
SASKATCHEWAN	2456.0	38000.0	808.8	6.8	329.332	8.667	119.51
ALBERTA	4369.0	37880.0	1068.3	12.9	244.528	6.455	83.03
BRITISH COLUMBIA	25781.0	36168.8	8647.4	77.2	335.419	9.274	111.97
YUKON	8353.0	37880.0	2382.9	30.3	285.279	7.531	78.65
NORTHWEST TERRITORIES	64762.0	37880.0	23401.3	162.4	361.343	9.539	144.10
CANADA	**161081.0**	**37675.0**	**49439.3**	**448.7**	**306.922**	**8.147**	**110.19**

TABLE 3.7

ELECTRIC UTILITIES
PROVINCIAL CONSUMPTION AND COST
NATURAL GAS
1988

PROVINCE OR TERRITORY	QUANTITY MILLIONS m3	HEAT CONTENT kJ/m3	COST '000 $	GENERATION GW.h	COST $/'000 m3	COST $/GJ	COST MILLS/kW.h
NEWFOUNDLAND	0.0	0.0	0.0	0.0	0.000	0.000	0.00
PRINCE EDWARD ISLAND	0.0	0.0	0.0	0.0	0.000	0.000	0.00
NOVA SCOTIA	0.0	0.0	0.0	0.0	0.000	0.000	0.00
NEW BRUNSWICK	0.0	0.0	0.0	0.0	0.000	0.000	0.00
QUÉBEC	0.0	0.0	0.0	0.0	0.000	0.000	0.00
ONTARIO	0.9	37395.1	160.6	3.0	177.643	4.750	53.76
MANITOBA	0.5	37223.0	68.1	1.3	127.735	3.432	51.85
SASKATCHEWAN	212.0	38033.8	18037.1	562.8	85.097	2.237	32.05
ALBERTA	798.0	38532.8	47392.8	2381.7	59.388	1.541	19.90
BRITISH COLUMBIA	41.6	37352.0	16326.4	129.1	392.338	10.504	126.49
YUKON	0.0	0.0	0.0	0.0	0.000	0.000	0.00
NORTHWEST TERRITORIES	0.0	0.0	0.0	0.0	0.000	0.000	0.00
CANADA	**1053.0**	**38384.1**	**81984.9**	**3077.9**	**77.856**	**2.028**	**26.64**

TABLE 3.8

ELECTRIC UTILITIES
PROVINCIAL CONSUMPTION AND COST
URANIUM
1988

PROVINCE OR TERRITORY	QUANTITY KILOGRAMS	HEAT CONTENT kJ/g	COST '000 $	GENERATION GW.h	COST $/kg	COST $/GJ	COST MILLS/kW.h
NEWFOUNDLAND	0.0	0.0	0.0	0.0	0.000	0.000	0.00
PRINCE EDWARD ISLAND	0.0	0.0	0.0	0.0	0.000	0.000	0.00
NOVA SCOTIA	0.0	0.0	0.0	0.0	0.000	0.000	0.00
NEW BRUNSWICK	101931.0	576200.0	14894.3	5341.7	146.121	0.254	2.79
QUÉBEC	95282.0	680000.0	11894.1	5282.2	124.830	0.184	2.25
ONTARIO	1160460.0	703651.5	352234.1	67552.1	303.530	0.431	5.21
MANITOBA	0.0	0.0	0.0	0.0	0.000	0.000	0.00
SASKATCHEWAN	0.0	0.0	0.0	0.0	0.000	0.000	0.00
ALBERTA	0.0	0.0	0.0	0.0	0.000	0.000	0.00
BRITISH COLUMBIA	0.0	0.0	0.0	0.0	0.000	0.000	0.00
YUKON	0.0	0.0	0.0	0.0	0.000	0.000	0.00
NORTHWEST TERRITORIES	0.0	0.0	0.0	0.0	0.000	0.000	0.00
CANADA	**1357673.0**	**692422.9**	**379022.5**	**78176.0**	**279.171**	**0.403**	**4.85**